



United States Department of the Interior

FISH AND WILDLIFE SERVICE

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In Reply Refer To:
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Memorandum

To: Field Manager, Palm Springs-South Coast Field Office
Bureau of Land Management, Palm Springs, California

From: Field Supervisor, Carlsbad Fish and Wildlife Office
Carlsbad, California

Subject: Biological Opinion on the Proposed Desert Harvest Solar Project,
Riverside County, California [CACA 044919]

This memorandum transmits the U.S. Fish and Wildlife Service's (Service) biological opinion on the Bureau of Land Management's (BLM) proposed issuance of a right-of-way (ROW) grant that would authorize the construction, operation, maintenance, and decommissioning of the proposed Desert Harvest Solar project (Project). This biological opinion analyzes the effects of the Project on the threatened Mojave desert tortoise (*Gopherus agassizii*, hereafter referred to as desert tortoise or tortoise) and its designated critical habitat in accordance with section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq.*). Your request for formal consultation dated May 8, 2012, was received on May 10, 2012. Additional information and revisions to the biological assessment were submitted on July 27, 2012, and August 28, 2012.

This biological opinion is primarily based on information provided in the following documents and communications: (1) BLM's *Draft Environmental Impact Statement and California Desert Conservation Area Plan Amendment for the Proposed Desert Harvest Solar Project* (BLM 2012); (2) *Biological Assessment for the Desert Harvest Solar Project* (Aspen Environmental 2012a); (3) *Biological Resources Technical Report for the Desert Harvest Project* (Aspen Environmental Group 2012b); (4) draft *Common Raven Management Plan for the Desert Harvest Solar Project* (Aspen Environmental Group 2012c); (5) draft *Desert Tortoise Translocation Plan for the Desert Harvest Solar Project* (Aspen Environmental Group 2012d); (6) draft *Integrated Weed Management Plan for the Desert Harvest Solar Project* (Aspen Environmental Group 2012e); (7) supplemental materials provided during the consultation process; (8) electronic transmissions from BLM, and Aspen Environmental Group; and (9) pertinent literature contained in our files. The Project file for this consultation is located at the Carlsbad Fish and Wildlife Office (CFWO).

CONSULTATION HISTORY

EDF-RE Renewable Energy (EDF), a wholly-owned subsidiary of EDF-RE Energies Nouvelles, initiated early coordination in 2010 with the Service, BLM, and California Department of Fish and Wildlife (CDFW), formerly California Department of Fish and Game, to discuss wildlife survey protocols for the Project. Between spring 2010 and spring 2011, consultants performed various biological surveys within the proposed boundaries. During this time, the Service coordinated with BLM, CDFW, and EDF (also referred to as the applicant), on the development of the measures contained in the biological assessment and BLM's draft environmental impact statement (DEIS) to avoid, minimize, and offset impacts to the desert tortoise. Between August 2011 and August 2012, regularly scheduled conference calls between the applicant, Service, BLM, and CDFW were held to discuss issues related to potential impacts to desert tortoises and measures to avoid, minimize, and offset those impacts, translocation, schedules for consultation and Project construction, and other topics. Additionally, we discussed with BLM and the applicant changes to the proposed action that would improve habitat connectivity within the action area and vicinity. We also conducted several visits to the Project with these agencies and applicant.

In preparing this biological opinion, we provided a draft biological opinion to the BLM for review and comment on October 29, 2012. The Service provided a copy of the draft to the CDFW to review and comment on October 10, 2012. We have incorporated comments received from the BLM and CDFW into this biological opinion, as appropriate.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The following description of the proposed action is a summary of the biological assessment, DEIS, and other supporting documents listed above (see pp. 1 and 2), subsequent language clarification via email, and further modifications based on comments received from the BLM on the draft biological opinion.

The proposed action is the BLM's issuance of a ROW grant that would authorize construction, operation, maintenance, and decommissioning of a commercial solar power generating facility on approximately 1,300 acres on BLM-managed lands. The Project is located in Riverside County approximately 5 miles north of the rural community of Desert Center (Figure 1). The Project has a minimum expected lifetime of 30 years, with an opportunity of 50 years or more with equipment replacement, repowering, and an extension of the applicable permits, approvals and authorizations. The BLM's authorization of the ROW grant for the Project would require an amendment to the California Desert Conservation Area (CDCA) plan, as amended (BLM 1999). Appendix 1 contains all of the figures referenced in the body of this biological opinion.

Solar Facility Construction

The proposed solar generation facility would be a 150 megawatt (MW) nominal capacity, alternating current solar photovoltaic (PV) energy-generating project. The proposed solar facility would consist of a main generation area, operations and maintenance (O&M) facility (either on or off the solar facility site), and onsite substation, switchyard, and site security. The solar generating facility would be located on 1,208 acres, and would be comprised of two separate parcels. The northern parcel consists of 1,053 acres and the southern parcel consists of 155 acres. Figure 2 illustrates the proposed solar facility and the associated components.

Construction Phasing

Construction of the Project would be implemented in three phases and is anticipated to commence during the second quarter of 2013, and continue through the third quarter of 2015. Phase 1 would include preconstruction surveys, exclusion fencing around a 10-acre site, clearing and construction of a laydown yard, parking area, and pad mounts for transformers. Phase 2 would include preconstruction surveys and all construction activities for the larger, northeastern portion of the solar facility site, and Phase 3 construction would include preconstruction surveys and all construction activities for the smaller, southwestern portion of the solar facility site (Figure 2).

Prior to any activities for any given phase, desert tortoise clearance surveys would be conducted in accordance with the Service's most recent *Desert Tortoise Field Manual* (Service 2009a). Construction would generally occur between 7 a.m. and 7 p.m., Monday through Friday. Additional hours may be necessary to correct schedule deficiencies or to complete critical construction activities. For instance, during hot weather, it may be necessary to start work earlier to avoid pouring concrete during high ambient temperatures. To protect workers' health and safety (to avoid heat-related health hazards) 7 a.m. to 3 p.m. would be used as an alternative construction schedule on a case-by-case basis, based on weather restrictions. During the startup phase, some activities may be performed over the weekend.

Solar Generation and Support Facilities

The solar facility would consist of arrays of PV modules on a single axis (high or low-profile) tracking system. The panel technology, either crystalline silicon or copper indium gallium selenide, has not been selected. All of the solar facility will be impacted by some form of soil disturbance, either from compaction, micro-grading, or disc-and-roll grading. Each array would consist of PV modules, a power conversion station, and a transformer. Installed panels would shade up to approximately 1,000 acres of the solar facility acreage and the solar panel would cover the majority of the Project.

The solar panel field will be laid out by installing the vertical H-pile galvanized steel beams directly into the ground by means of a small pile-driver. Soil tests would be required to validate

the preliminary engineering. If geotechnical tests conclude that further foundations are required, then the vertical H-pile galvanized steel beams would be attached to concrete ballasts.

The PV modules would be connected electrically by wire harnesses and combiner boxes that would collect power from several rows of modules and feed the power conversion stations via direct current cables. Direct current cable placed in underground trenches would be covered approximately 3 feet deep and from 1.5 to 2.5 feet wide. Power screeners may be used on site for up to 1 year to extract the required clean fill from native soils excavated during trenching for use as bedding material in the trenches.

Power conversion stations would convert direct current electric input to alternating current output and transmit the power to a transformer. A power conversion station and transformer placed on a concrete pad would be located within each PV array. The power conversion station enclosures would be approximately 11.5 feet tall and the transformers would be approximately 6.3 feet tall. The transformer would step up the voltage of the alternating current electrical input to 34.5 kilovolt (kV) and then transmit the power via underground lines in covered trenches to the PV combining switchgear. Alternating cable trenches would be approximately 3 feet deep and from 8 inches to 6.5 feet wide, depending on the number of cables buried adjacent to one another, and would also be used to house fiber optic cables.

High-capacity 34.5-kV collection system lines would connect the power output from the PV combining switchgear to the onsite substation via overhead lines. These overhead lines would be supported by wooden poles approximately 52 feet above finished grade. The overhead lines would span a distance of approximately 150 feet from pole to pole. The onsite electrical collection system would be designed to minimize electrical losses within the solar facility site prior to delivery to the onsite substation.

The substation would be located in the northwest corner of the site and would cover approximately 3 acres. The primary access road (up to 26 feet wide) would serve the onsite substation. At the onsite substation, the voltage of the solar-generated electricity would be stepped up to 220 kV. The southern parcel would be electrically connected to the onsite substation by either an underground or overhead connection for a distance of 3,000 feet between the electrical power conversion stations on the southern and northern parcels. The overhead alternative would involve reconductoring an existing Southern California Edison (SCE) distribution line. An underground connection would run along an easement on the eastern side of Kaiser Road. The route would parallel the natural gas line adjacent to Kaiser Road. Construction of the line would occur concurrently with construction of the Project generation intertie (gen-tie) line, using the same equipment and personnel. For an underground connection, trenching would be 3 to 6 feet wide. Temporary disturbance would be up to 75,000 square feet and trenching would disturb 18,000 square feet within the disturbance footprint.

EDF proposes to draw water from two new and/or existing local wells to meet construction water demands, one of which would continue to be used for Project operations. If needed EDF may use nearby (within 10 miles) offsite active wells and truck water to the onsite water treatment

facility described below. No new roads would be required and no new ground disturbance would occur as a result of the use of offsite wells.

A water treatment facility and a demineralization evaporation pond may be required on site to treat well water containing total dissolved solids. A water treatment system consisting of a double-pass reverse osmosis (RO) system may be installed near the main O&M well, most likely adjacent to the onsite Project substation. The water treatment facility would be enclosed in a small structure and would be approximately 6 feet wide by 12 feet deep and approximately 6 feet high. The facility would consist of three flexible PVC hoses: one input hose from the well water source, two output hoses with demineralized water going to the water trucks or tanks, and the reject water going to the demineralization evaporation pond. Reject water would be piped to a lined evaporation pond with four sections comprising approximately an acre. The location and need of this pond will be determined during final engineering. Residue would be periodically removed from the ponds and disposed of at an approved facility. For O&M EDF would re-purpose one of the construction holding ponds as a settling pond for RO reject water.

Lighting during construction would be limited to the staging area for the construction trailers, parking area, and site security facilities and be located on temporary service poles estimated at 18 feet in height. Power would come from a connection to the local distribution system or from an onsite generator. Construction lighting would be limited to that needed to ensure safety. It would be focused downward, shielded, and directed toward the interior of the site to minimize light exposure to areas outside the construction area.

Access to the Facility

Access to the Project would be from the existing Kaiser Road along the western boundary. A lane for truck turn-off would likely be required on Kaiser Road and a 20-foot-wide access road connecting the northwest corner of the solar facility to Kaiser Road. Components would be delivered via Kaiser Road, on a schedule to be determined by the contractor. Worker access would be controlled through a locked entrance gate in the west corner of the northern parcel.

Access within the Project would be provided by 14- to 26-foot wide unpaved, ungraveled roads running east-west, and 14-foot wide graveled roads running north-south that would be cleared, graded, and covered with aggregate and compacted to 90 percent to allow fire and maintenance vehicle access. Gravel and/or aggregate would be sifted from onsite soil or obtained from a BLM-approved commercial quarry within 6 miles of the Project site. The total length of onsite roads would be 109 miles, and the total area that would be covered by roads would be 210 to 260 acres.

Construction Activities

The onsite workforce would consist of laborers, craftsmen, supervisory personnel, supply personnel, and construction management personnel. The peak number of construction-related automobile trips would be up to 446 one-way trips per day (assuming a 30 percent carpool rate);

and the average annual construction-related automobile trips is estimated to be 178 one-way trips per day (89 round trips).

Site preparation would begin shortly after the completion of permitting. Final surveying, to accommodate existing ROW grants and setback requirements for Kaiser Road, the gas ROW along the eastern portion of the road, and Federal Energy Regulatory Commission (FERC) transmission ROW would precede any site work. Surveying would be completed by a California licensed land surveyor. The surveyor would stake the edges of the Project prior to erection of the security fencing. A permanent perimeter security fence and desert tortoise exclusion fencing would be installed around each development phase prior construction. Once fencing has been erected and desert tortoise clearance surveys are complete, site preparation would consist of removing vegetation within the fenced areas. An estimated 10 percent of the entire fenced area would be scarified to remove vegetation on all the access roads between the 1.44 MW rows of solar panels. Preparation would proceed by section, so that only the portion of where panels would be laid out would be scarified at any one time. In addition, any vegetation over 18 inches would be removed to avoid interaction with the solar panels. Annuals and smaller perennials would remain.

EDF would implement an Integrated Weed Management Plan (IWMP), preapproved by the BLM, which prescribes management actions to monitor and eradicate non-ubiquitous target species. Vegetation within the solar panel field would not be allowed to grow above 18 inches underneath the panels, to prevent fire hazard or disruption of panel performance. At a minimum, the access roads in the PV field would be maintained free from woody vegetation through the use of targeted herbicide spraying, occasional scarifying, or weeding to reduce fire hazard and allow access to the panel arrays.

Operations and Maintenance

The Project would employ up to eight full-time staff during operations. Maintenance staff would access the facility using four pickup trucks and the trucks would travel to the site daily from an offsite O&M building if the offsite location is used. A total of 35 daily round trips are estimated for O&M, based on the number of permanent employees, security personnel, and deliveries per day to the proposed site.

Onsite roads would be maintained to minimize fugitive dust and prevent erosion. Additional gravel or surface treatments may be required to maintain the roadbed integrity. All periodic access for the O&M activities would use the road network discussed above. The access roads in the solar panel field would be maintained free from vegetation through the use of targeted spraying of herbicides, occasional scarifying, or weeding to reduce fire hazard and allow access to the panel arrays. Vegetation would be allowed to re-grow within the solar panel field, but would be maintained below a height of 18 inches to prevent interference with solar panels. The Project will include a Vegetation Resources Management Plan and an IWMP per Mitigation Measures VEG-5 and VEG-9, to be reviewed and approved by BLM. The Vegetation Resources Management Plan will address the potential function of vegetation to minimize erosion, and the

possibility that vegetation could be an attractive nuisance for wildlife or a fire/fuel management hazard.

Lighting would be limited to shielded, area-specific lighting for security purposes for the onsite substation. Security lights would use motion sensors that would be triggered by movement at a human's height. To minimize the visual impact on surrounding receptors and roads, no lights would be used around the Project perimeter. Sensors on the security fencing would alert security personnel of possible intruders. Onsite lights would be shielded and focused downward and toward the interior of the site to minimize lighting impacts on the night sky and to neighboring areas. Portable lighting may be used occasionally and temporarily for maintenance activities during operations.

During operation, water would be required for solar panel washing two to three times per year. If offsite wells are used, water would be trucked to the solar facility from up to 10 miles away in up to 1,200 water trucks annually. Panel wash water would be purified using the onsite RO system. The total water used would be between 18 and 27 acre-feet per year. Domestic wastewater would be treated and disposed of at the site using a septic disposal system consisting of septic tanks and leach field, which would be contained within the site perimeter fence.

Decommissioning

The ROW grant for the proposed solar generation facility is 30 years, but the operational life of the facility may be as long as 50 years. If permanent closure is imminent, BLM would require a Decommissioning Plan be developed and implemented. The procedures provided in any Decommissioning Plan would be developed to ensure compliance with applicable laws and regulations and to ensure protection of public health and safety and the environment. Closure strategies may include temporary "mothballing," removing old facilities and upgrading to newer solar technology; or complete removal of equipment and restoration of the land to BLM specifications. Fully decommissioning the site would involve removal and demolition of above-ground structures, dismantling and removing concrete structures to a depth of 3 feet, removal of underground utilities within 3 feet of final grade, and excavation and removal of contaminated soils, if applicable. The Decommissioning Plan would be submitted to BLM for review and approval prior to closure. At the time of decommissioning BLM would contact the Service to determine if reinitiating, pursuant to 50 CFR § 402.16, would be appropriate.

Gen-Tie Transmission Line

The applicant proposed to co-locate the EDF gen-tie transmission line by using the same gen-tie towers and alignment as the approved Desert Sunlight project (identified in the Desert Sunlight biological opinion as gen-tie Alternative A-1 and in the Desert Harvest biological assessment and DEIS as gen-tie Alternative B.) Under regulations implementing the Act, the environmental baseline includes the anticipated impacts of all proposed Federal projects in an action area that have already undergone formal or early section 7 Consultation (50 C.F.R. §402.02). Because permanent disturbance, including the foundations of the transmission structures, the footprint of

the access road, and stringing areas was analyzed in the Desert Sunlight biological opinion, these impacts are considered within the baseline condition of the Desert Harvest project. Negotiations for the placement of the co-located gen-tie between Desert Harvest and the owners of Desert Sunlight are ongoing and BLM will grant a notice-to-proceed for the transmission line when the issue is settled. Under a co-located gen-tie arrangement, if Desert Sunlight gen-tie line construction commences prior to or at the same time as the construction schedule for the proposed action, then the proposed co-located gen-tie would simply consist of an additional line strung on the gen-tie line towers of the Desert Sunlight project. Under such a scenario, after construction of the transmission infrastructure approved for the Desert Sunlight project, stringing of the EDF gen-tie line would occur concurrently with the stringing of Desert Sunlight's gen-tie line, and would require no additional equipment, personnel, or time beyond that already required and approved for the Desert Sunlight gen-tie line. If the gen-tie lines cannot be strung concurrently, then temporary disturbance will be within the construction corridor and wire stringing activities will use previously cleared or graded sites (fan-shaped areas at each turn alignment for wire stringing). Conservation measures are also proposed to address temporary disturbance impacts associated with wire stringing (e.g., dust abatement). The same access roads would be used for maintenance of both companies' conductors, and the conductors would be maintained concurrently using the same maintenance service provider. For these reasons the impacts of stringing the gen-tie line after the Desert Sunlight gen-tie line is not expected to result in impacts beyond environmental baseline conditions.

Gen-Tie Construction

Construction of the gen-tie would cause temporary disturbance within a construction corridor estimated at a width of 160 feet, plus fan-shaped areas at each turn in the alignment with radii of 450 feet needed for wire stringing. Preconstruction survey work would consist of flagging the ROW, staking structure locations, and conducting biological clearance surveys. Upon notice to proceed, the contractor and construction management would assemble their onsite management and construction staff at a temporary office including phone, fax, and data lines would be located within the perimeter fence in the laydown yard. The contractor and construction subcontractors would have separate field offices.

A laydown yard would be prepared for storage of materials within the Project footprint. Additional yards may be established to serve as material marshaling facilities, crew assembly locations, and equipment yards. These yards would all be within the Project footprint and would not require any additional ground disturbance.

EDF would use permanent access roads and temporary roads constructed and used by Desert Sunlight to access transmission structure locations. Previously cleared and graded sites for the wire setup sites and puller and tensioner sites would be used for the wire stringing operation. No disturbance beyond the clearing limits would be allowed. Preventative measures to minimize wind transport of soil would be implemented. Dust abatement would be accomplished through watering.

Final inspection and testing would need to be coordinated with functional checkout and commissioning of the substation equipment at each end of the line. The ROW would be cleared of all construction materials and equipment at the end of construction.

Construction Schedule

Construction would begin in the second quarter of 2013 (depending on record of decision issuance) and would last for an estimated 12 months. Gen-tie construction would occur concurrently with Desert Sunlight, if feasible.

Gen-Tie Operations and Maintenance

O&M personnel would perform periodic maintenance of the gen-tie line, and no additional personnel would be required. O&M would involve periodic inspection via helicopter or truck. The transmission lines would be maintained on an as-needed basis and would include maintenance of access roads and erosion/drainage control structures.

Gen-Tie Decommissioning

A final Decommissioning Plan would be developed prior to facility closure, based on conditions at that time. The Decommissioning Plan would be developed in coordination with the BLM and submitted to the BLM for review and approval prior to final closure. Due to lack of details about decommissioning or the ability to project future conditions, the BLM would contact the Service to determine if additional consultation, pursuant to 50 CFR § 402.16, would be appropriate.

Conservation Measures

The proposed action includes conservation, minimization, and compensation measures that would be implemented by the applicant to avoid, minimize, and offset potential adverse effects to the desert tortoise. The Service, BLM, CDFW, and applicant worked closely on developing these measures. The conservation measures are part of the proposed action evaluated below in our effects analysis; as such, without prior agreement by the Service, any significant deviation from these measures during Project implementation would constitute grounds for reinitiation of formal consultation if the deviation causes an effect to listed species or critical habitat that was not considered in this biological opinion. Below is a partial list from the DEIS pertinent to the analysis which correspond with the conservation measures found in the biological assessment (Aspen Environmental 2012a). For the purpose of this opinion, mitigation measures have been abbreviated to the sections that address desert tortoise impacts. A complete list and descriptions of these measures are provided in DEIS (BLM 2012). In some cases, we have modified the language to improve clarity, but we have not changed the intent of the measures that the applicant and BLM have proposed.

- MM-VEG-1: Authorized Biologists and Biological Monitors
- MM-VEG-2: Conduct Biological Monitoring
- MM-VEG-3: Worker Environmental Awareness Program
- MM-VEG-4: Minimize Construction-Related Impacts
- MM-VEG-5: Vegetation Resources Management Plan
- MM-VEG-6: Provide Off-Site Compensation for Impact to Vegetation and Habitat
- MM-VEG-9: Prepare and Implement IWMP
- MM-WIL-1: Wildlife Avoidance and Minimization
- MM-WIL-2: Desert Tortoise Clearance Surveys, Exclusion Fencing and Translocation
- MM-WIL-8: Raven Monitoring and Management
- MM-AQ-1: Dust Control Plan
- MM-HAZ-10: Decommissioning Plan

1. Authorized Biologist and Biological Monitoring (MM-VEG-1, MM-VEG-2) – EDF will assign a staff person to act as the Project Field Contact Representative (FCR) (i.e., Designated Biologist or FCR) with specific experience in the implementation of environmental compliance programs. The FCR will be present throughout construction, O&M, and decommissioning of the Project. This individual will be the liaison among the wildlife agencies, BLM, Authorized Biologist(s), and Biological Monitor(s). The FCR and Authorized Biologist will work closely together to ensure compliance with the various conditions and requirements of Project permits and approvals set forth in the biological opinion, supporting plans appended to the biological assessment, and the final environmental impact statement.

The Authorized Biologist(s) will be approved by the Service, BLM, and CDFW. Biological Monitors will be approved by BLM and will meet or exceed the minimum educational and experience qualifications with regard to desert tortoise. Resumes of potential Authorized Biologists will be submitted to the Service, BLM, and CDFW no less than 30 days prior to the beginning of any Project ground disturbing activities (e.g., grading, boring, or trenching).

The Authorized Biologist will have the knowledge and experience to conduct any or all of the following:

- a. Locate, identify, and report all forms of desert tortoise sign in accordance with approved protocols;
- b. Handle and temporarily hold desert tortoises;
- c. Move desert tortoises from harm's way when they enter Project sites;
- d. Relocate/translocate desert tortoises prior to implementation;
- e. Excavate burrows to locate desert tortoises;

- f. Reconstruct desert tortoise burrows;
- g. Unearth and relocate desert tortoise eggs;
- h. Approve individual Biological Monitors and their activities;
- i. Directly supervise biological monitors during clearance surveys and train monitors in all aspects of protecting desert tortoises during implementation;
- j. Understand and implement all requirements, including the biological opinion, and license (copy in hand);
- k. Ensure proper implementation of protective measures;
- l. Record and report incidents of noncompliance in accordance with a biological opinion; and
- m. Halt Project activities per provisions of the biological opinion. Only the Authorized Biologist will translocate any desert tortoises in the Project, determined not be a candidate for exclusion with fencing, to a recipient site within California.

Desert Tortoise Authorized Biologist Duties and Qualifications

The applicant shall ensure that the Authorized Biologist performs the activities described below during any site mobilization activities and construction-related ground disturbance (e.g., grading, boring, trenching). No ground disturbance shall commence until an approved Authorized Biologist is on site. The Authorized Biologist may be assisted by an approved Biological Monitor(s) but remains the contact for the FCR and the BLM. Only individuals approved by the Service and BLM will handle desert tortoises and only in compliance with all requirements of the biological opinion.

The Authorized Biologist duties shall include the following:

- a. Supervise, conduct, and coordinate mitigation, monitoring, and other biological resources compliance requirements, particularly in areas requiring avoidance or containing sensitive biological resources, such as special-status species or their habitat;
- b. Clearly mark sensitive biological resource areas and verify personally or use Biological Monitor(s) to check for compliance with all impact avoidance and minimization measures including checking all exclusion zones to ensure that signs, stakes, and fencing are intact and that project-related activities are restricted in these protective zones;

- c. Conduct continuous compliance inspections throughout the initial site preparation activities, including the construction of tortoise-exclusion fencing; preconstruction clearance surveys; and initial clearing, grubbing, and grading. Provide weekly verbal or written updates to the Service, BLM, CDFW, and County of Riverside.
- d. Monitor perimeter fence and desert tortoise exclusion fence installation and conduct preconstruction desert tortoise clearance surveys within the solar facility perimeter fence;
- e. Inspect active construction areas where animals may have become trapped prior to construction commencing each day. At the end of the day, inspect for the installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Periodically inspect areas with high vehicle activity (e.g., parking lots) for animals in harm's way;
- f. Remain on site daily in areas located outside of permanent desert tortoise exclusion fencing while vegetation salvage, grubbing, grading and other ground-disturbance construction activities are taking place to ensure conservation measures are properly implemented;
- g. Train the Biological Monitor(s) as appropriate, and ensure their competence in the Worker Environmental Awareness Program (WEAP) (MM-VEG-3) training program, and Service guidance regarding desert tortoise surveys, handling procedures, and translocation;
- h. Maintain the ability to be in regular, direct communication with representatives of the Service, BLM, and CDFW, including notifying these agencies of dead or injured listed species and reporting special-status species observations to the California Natural Diversity Data Base;
- i. Report all special-status species observations to the California Natural Diversity Database and include copies of these reports in monthly or quarterly monitoring reports, and immediately report any dead or injured listed threatened or endangered species to the Service and CDFW; and
- j. Notify the applicant and BLM of any non-compliance with any of the conservation measures set forth in this biological opinion.

Desert Tortoise Authorized Biologist Qualifications

- a. Bachelor's degree in biological sciences, zoology, botany, ecology, or a closely related field;
- b. At least 3 years of experience in field biology or current certification of a nationally

recognized biological society, such as The Ecological Society of America or The Wildlife Society;

- c. At least 1 year of direct field experience with biological resources found in or near the Project area, including desert tortoise;
- d. Meet the current Service Authorized Biologist qualifications criteria (http://fws.gov/ventura/species_information/protocols_guidelines/index.html), demonstrate competence in protocols and guidelines for the desert tortoise, and be approved by the Service (Note: Biologists who meet earlier Service criteria may not meet current criteria due to requirements to assess health and draw blood, and biologists must obtain training such as that offered through the Desert Tortoise Conservation Center in Las Vegas.);
- e. Possess a California Endangered Species Act Memorandum of Understanding pursuant to Section 2081(a) for desert tortoise; and
- f. In lieu of any of the above requirements, the resume shall demonstrate to the satisfaction of the Service, BLM, and CDFW that the proposed Authorized Biologist has the appropriate training and background to effectively implement the conservation measures.

Desert Tortoise Biological Monitor Selection and Qualifications

The Authorized Biologist shall submit the resume(s), at least three references, and contact information of the proposed Biological Monitor(s) to the BLM and CDFW. The résumé shall exhibit, to the satisfaction of the BLM and CDFW, the appropriate education and experience to accomplish the assigned biological resource tasks.

Biological Monitor(s) shall be trained by the Authorized Biologist to ensure competence in the WEAP training program, and Service guidance regarding desert tortoise surveys, handling procedures, and translocation. The Authorized Biologist shall submit a written statement to the BLM confirming that individual Biological Monitor(s) have had appropriate training and the dates when training was completed.

Desert Tortoise Biological Monitor Duties

The Biological Monitor(s) shall assist the Authorized Biologist in conducting surveys, in monitoring perimeter fence and desert tortoise exclusion fence installation and conduct preconstruction desert tortoise clearance surveys within the solar facility perimeter fence, construction-related ground disturbance (e.g., grading, boring or trenching). The Authorized Biologist shall remain the primary contact for the applicant and the BLM.

Desert Tortoise Authorized Biologist and Biological Monitor Authority

The applicant's FCR shall act on the advice of the Authorized Biologist and Biological Monitor(s) to ensure conformance with the conservation measures set forth in this biological opinion. The Authorized Biologist shall have the authority to immediately stop any activity that is not in compliance with these conditions and/or order any reasonable measure to avoid take of an individual of a listed species. If required by the Authorized Biologist and Biological Monitor(s), the applicant's FCR or their construction/operation manager shall halt all site mobilization, construction-related ground disturbance, and O&M activities in areas specified by the Authorized Biologist. The Authorized Biologist shall:

- a. Notify the Service, BLM, CDFW, and County of Riverside at least 14 calendar days before initiation of ground-disturbing activities;
- b. Immediately notify the Service, BLM, CDFW, and County of Riverside (as applicable) in writing of any non-compliance with any of the biological mitigation measures or permit conditions;
- c. Require a halt to all activities in any area where there would be an unauthorized adverse impact to biological resources if the activities continued;
- d. Inform the applicant and the FCR when to resume activities; and
- e. Notify the BLM and if there is a halt of any activities and advise them of any corrective actions that have been taken or would be instituted to rectify the situation. If the work stoppage relates to desert tortoises or any other Federal or State-listed species, the Service and CDFW shall also be notified.

If the Authorized Biologist is unavailable for direct consultation, the Biological Monitor(s) shall act on behalf of the Authorized Biologist. The applicant shall ensure that the Authorized Biologist or Biological Monitor(s) notifies the BLM immediately (and no later than the morning following the incident, or Monday morning in the case of a weekend) of any non-compliance or a halt of any site mobilization, construction-related ground disturbance, or O&M activities. If the non-compliance or halt to construction or O&M relates to desert tortoises or any other Federal or State listed species, the applicant shall notify the Service and the Regional Office of CDFW in Ontario, California, at the same time. The applicant shall notify BLM of the circumstances and actions being taken to resolve the non-compliance. The BLM, in coordination with the Service and CDFW, would review any corrective action taken by the applicant to determine success or failure, or if additional time is required to evaluate the circumstances. The BLM would notify the applicant of its determination within 5 working days of receipt of notice that corrective actions have been taken.

Throughout the construction and decommissioning phases of the Project, the Authorized Biologist will submit a monthly compliance report to EDF, BLM, County of Riverside, and National Park Service. After construction has been completed, and again when decommissioning is complete, the Authorized Biologist will provide EDF, BLM, County of Riverside, and NPS with final construction-phase and decommissioning-phase monitoring reports. During the O&M phase, the reporting schedule will be annually rather than quarterly. EDF will be responsible for ensuring that construction monitoring is conducted during all Project phases.

2. Worker Environmental Awareness Program (MM-VEG-3) – EDF shall be responsible for ensuring that all workers at the site receive worker environmental awareness training prior to construction and throughout the construction, operations, and decommissioning phases. The training shall be administered to all onsite personnel including surveyors, construction engineers, employees, contractors, contractor's employees, supervisors, inspectors, subcontractors, and delivery personnel. EDF will implement the WEAP to ensure the Project construction and operation is both conducted within a framework of safe guarding environmentally sensitive resources. The WEAP will be available in English and Spanish. Applicant will present the WEAP to all workers on site throughout the life of the Project. Multiple sessions of the presentation may be given to accommodate training all workers. Wallet-sized cards summarizing the information will be provided to all construction and O&M personnel. The worker environmental awareness training shall be subject to approval by the Service, BLM, and CDFW, and shall include but will not be limited to the following measures (see the DEIS for a full list of WEAP training items):
 - a. Be developed by or in consultation with the Authorized Biologist and consist of an onsite or training center presentation in which supporting written material and electronic media, including photographs of protected species, is made available to all participants;
 - b. Provide an explanation of the function of flagging that designates authorized work areas;
 - c. Discuss general safety protocols such as hazardous substance spill prevention and containment measures and fire prevention and protection measures;
 - d. Provide an explanation of the sensitivity and locations of the vegetation, biological resources, and habitat within and adjacent to work areas, and proper identification of these resources;
 - e. Place special emphasis on desert tortoise, including information on physical characteristics, photos, distribution, behavior, ecology, sensitivity to human activities, legal protection, penalties for violations, reporting requirements, and conservation measures required for the Project;

- f. Discuss the importance of avoiding the introduction of invasive weeds onto the Project site and surrounding areas, describe the IWMP (MM VEG-9) and applicable compliance requirements for workers on the site;
- g. Provide contact information for the Authorized Biologist and Biological Monitor(s) to handle late comments and questions about the material discussed in the program, as well as notification of any dead or injured wildlife species encountered during project-related activities;
- h. Direct all WEAP trainees to report all observations of listed species and their sign to the Authorized Biologist for inclusion in the monthly compliance report; and
- i. Include a training acknowledgment form to be signed by each worker indicating that they received training and will abide by the guidelines.

In addition to employee, contractor, and worker training, the awareness program shall include printed training materials and prominently display posters and descriptions in offices, conference rooms, employee break rooms, and other areas where employees may congregate. The printed materials will include photographs and brief descriptions of crucifixion thorn and other special-status plants that may be encountered, desert tortoise, Mojave fringe-toed lizards, burrowing owls, golden eagles, nesting birds, desert kit fox, roosting bats, Palm Springs round-tailed ground squirrels, Nelson's bighorn sheep, and American badger, including behavior, ecology, sensitivity to human activities, legal protection, penalties for violations, reporting requirements, and protection measures.

At least 45 days prior to construction-related ground disturbance, the applicant shall provide the Service, BLM, and CDFW a draft program for review and approval. A copy of the final WEAP and all supporting written materials and electronic media prepared or reviewed by the Authorized Biologist and a resume of the person(s) administering the program shall also be submitted to the BLM. The WEAP may be administered by a competent individual(s) acceptable to the Authorized Biologist.

The applicant shall provide in the monthly compliance report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date. At least 10 days prior to construction-related ground disturbance activities the applicant shall submit two copies of the final WEAP to BLM.

Training acknowledgement forms signed during construction shall be kept on file by the applicant for at least 6 months after the start of commercial operation. Throughout the life of the Project, the WEAP shall be repeated annually for permanent employees, and shall be routinely administered within a week of arrival to any new construction personnel, foremen, contractors, subcontractors, and other personnel potentially working within the Project. Upon completion of the orientation, employees shall sign a form confirming that they attended the program and understood all protection measures. These forms shall be

maintained by the applicant and shall be made available to the Service, BLM, and CDFW and upon request. Workers shall receive and be required to visibly display a hardhat sticker or certificate that they have completed the training. During Project operation, signed statements for operational personnel shall be kept on file for 6 months following the termination of an individual's employment.

3. Minimize Construction-Related Impacts (MM-VEG-4) – Final engineering of the Project will reduce the extent of temporary construction work areas to the fullest extent and minimize impacts to native vegetation and habitat. The list below summarizes a range of design features, avoidance practices, and Best Management Practices (BMPs) to be implemented during construction.
 - a. Prior to the start of construction, work areas (e.g., staging areas, access roads, sites for temporary placement of construction materials and spoils) will be delineated with orange construction fencing or staking to clearly identify the limits of work and will be verified by the Authorized Biologist or the Biological Monitor(s) (MM-VEG-1) prior to ground-disturbing activities;
 - b. All disturbances, vehicles, and equipment will be confined to the fenced/flagged areas. Fencing/staking will remain in place for the duration of construction. All disturbances, vehicles, and equipment will be confined to the fenced/flagged areas. Any areas of temporary disturbance will be revegetated according to the BLM-approved Vegetation Resources Management Plan (MM-VEG-5);
 - c. New and existing roads, road widening, or other road improvements shall not extend beyond the flagged impact area. All vehicles passing or turning around would do so within the flagged impact area or in previously disturbed areas. Where new access is required, the route shall be clearly marked (i.e., flagged and/or staked) prior to the onset of construction;
 - d. Spoils and topsoil will be stockpiled in areas already disturbed or to be disturbed by construction, so that stockpile sites do not add to total disturbance footprint. Disturbance of shrubs and surface soils due to stockpiling will be minimized to the fullest extent;
 - e. When feasible, construction activities will implement drive and crush rather than grading. Construction equipment would drive over and crush native plants to minimize impacts to the roots of desert shrubs. Drive and crush is expected to reduce the recovery time of desert shrubs within the temporary construction areas;
 - f. No pets or firearms will be allowed on the Project site during construction, O&M, or decommissioning;

- g. All vehicles and equipment shall be maintained in proper working condition to minimize the potential for fugitive emissions of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials. Hazardous spills shall be immediately cleaned up and the contaminated soil properly disposed of at a licensed facility. Fueling and servicing of construction equipment shall take place only at a designated area approved by the Authorized Biologist. Service/maintenance vehicles shall carry a bucket and pads to absorb leaks or spills; and
 - h. Soil bonding and weighting agents used on unpaved surfaces shall be non-toxic to wildlife and plants.
4. Compensation for Desert Tortoise Habitat Loss (MM-VEG -6) – EDF proposes to offset impacts to vegetation and wildlife habitat resources by protecting in perpetuity lands that meet CDFW's fully mitigate standard and are consistent with the Northern and Eastern Colorado Desert Coordinated Management Plan (NECO) (BLM 2002). EDF will prepare a habitat compensation plan specifying habitat compensation ratios and incorporating all requirements detailed by the conservation measure (MM-VEG-6). As required by the NECO Plan and consistent with past practice, the mitigation ratio for impacts to the Chuckwalla Desert Wildlife Management Area (DWMA) is 5:1, impacts to desert tortoise habitat outside of the DWMA is 1:1, and impacts to desert dry wash woodland is 3:1. This measure requires the permanent protection and management of the compensation lands for desert tortoise, and enhancement actions, as needed, such as habitat restoration, invasive plant control, road closures or road fencing, and controlling ravens and other predators. This measure also includes an estimate of total cost to acquire and manage compensation lands, based on current estimates of land values, evaluation and transaction costs, habitat improvements, and long-term management. In accordance with the measure, EDF shall acquire and protect the compensation lands, or provide financial assurance acceptable to CDFW and BLM sufficient to carry out the habitat acquisition and management, no later than 30 days prior to initiation of ground disturbance.

For impacts to desert tortoise, EDF will compensate the acreage of the entire Project footprint at a 1:1 ratio within the Desert Tortoise Connectivity Corridor (Service 2011a). The Desert Tortoise Connectivity Corridor follows the Interstate 10 (I-10) corridor between Desert Center and Cactus City in the Colorado Desert Tortoise Recovery Unit, thereby contributing to wildlife movement and desert tortoise population connectivity.

Table 1. Compensation Acreage for Project

Resource	Acres of Impact	Compensation Ratio	Compensation Acres
Previously disturbed (no compensation)	2 ¹	0	0
All acreage within Chuckwalla DWMA and/or Chuckwalla Critical Habitat Unit (CHU)	34.2	5:1	171
Blue palo verde–ironwood woodland (desert dry wash woodland), including State-jurisdictional streambeds mapped within woodland habitat (includes acreage within Palen-Ford Wildlife Habitat Management Area (WHMA); excludes DWMA and CHU)	228.3	3:1	684.9
State-jurisdictional streambeds mapped within creosote bush scrub (Sonoran desert scrub) habitat (includes acreage within Palen-Ford WHMA; excludes DWMA and CHU)	78.5	3:1	235.5
Creosote bush scrub (Sonoran desert scrub), excluding State-jurisdictional streambeds mapped within creosote bush scrub habitat (includes acreage within Palen-Ford WHMA; excludes DWMA and CHU)	957	1:1	957
Minimum Total Habitat Compensation Requirement	1,300 ²		2,048.4 ³

¹CDFW may require all previously disturbed lands be compensated at 1:1 ratio.

²The entire footprint will be compensated within the Desert Tortoise Connectivity Corridor.

³Total acres may change if EDF and Desert Sunlight enter into a compensation agreement. Total impacts for the gen-tie are 92 acres, which includes 34.2 acres of impacts within the Chuckwalla DWMA and/or CHU.

Final compensation requirements shall be adjusted to account for any deviations in Project disturbance, according to final design, and as-built Project footprint. EDF shall be responsible for all compensation for habitat disturbance at the Project site, gen-tie line, and associated access roads. Habitat compensation will be implemented as follows:

- a. **“Nested” Compensation.** If any portion of the acquired compensation lands meets the habitat occupancy and suitability requirement for more than one of the resources listed in the compensation plan, that portion of the acquired lands may also be used to fulfill the obligation to offset impacts to those resources through land acquisition. Where impacted habitats meet criteria as two or more compensation ratios, the highest ratio will apply. For example, impacts to occupied desert tortoise habitat in creosote bush scrub (Sonoran desert scrub) within the Chuckwalla DWMA would require mitigation at a 5:1 ratio.
- b. **Compensation Land Selection Criteria.** As described in the DEIS (BLM 2012) for the Project, criteria for the acquisition, initial protection and habitat improvement, and long-term maintenance and management of compensation lands for impacts to biological resources shall include all of the following:

- i. Compensation lands selected for acquisition will provide habitat value that is equal to or better than the quality and function of the habitat impacted, to be determined by the Service, BLM, and CDFW, taking into consideration soils, vegetation, topography, human-related disturbance, wildlife movement opportunity, proximity to other protected lands, management feasibility, and other habitat values;
- ii. Compensation lands for impacts to desert tortoise must:
 - (A) Be within the Colorado Desert Tortoise Recovery Unit;
 - (B) Be near larger blocks of lands that are either already protected or planned for protection, or which could feasibly be protected long-term by a public resource agency or a non-governmental organization dedicated to habitat preservation;
 - (C) Not have a history of intensive recreational use or other disturbance that might cause future erosion or other habitat damage, and make habitat recovery and restoration infeasible;
 - (D) Not be characterized by high densities of invasive species, either on or immediately adjacent to the parcels under consideration, that might jeopardize habitat recovery and restoration;
 - (E) Not contain hazardous wastes that cannot be removed to the extent that the site could not provide suitable habitat;
 - (F) Provide wildlife movement value equal to that on the Project site, to be determined by the Service, BLM, and CDFW, based on topography, presence and nature of movement barriers or crossing points, location in relationship to other habitat areas, management feasibility, and other habitat values;
 - (G) Have water and mineral rights included as part of the acquisition, unless the BLM and County of Riverside, in consultation with CDFW and Service, agree in writing to the acceptability of land without these rights;
 - (H) Be contiguous and biologically connected to lands currently occupied by desert tortoise, ideally with populations that are stable, recovering, or likely to recover (for lands proposed as desert tortoise habitat compensation; and
 - (I) Contribute to wildlife movement and desert tortoise population connectivity of value equal to that of the Project and build linkages

between desert tortoise CHUs, known populations of desert tortoise, and other lands allocated for conservation. The primary focus area for acquiring parcels to maintain/improve connectivity will be along the I-10 corridor between Desert Center and Cactus City, with a priority on parcels that connect conserved lands on either side of the I-10 through large culverts or bridges. Between 1,254 to 1,300 acres (solar facility site and gen-tie) will be acquired along the I-10 corridor (1:1 for each acre of total long-term and permanent disturbance); a lesser amount within the corridor shall only be acceptable to the Service, BLM, and CDFW, upon written demonstration of the lack of available, comparable quality desert tortoise habitat within the I-10 corridor. The remainder of compensation acreage may be located outside the I-10 corridor, such as parcels acquired by the CDFW under Senate Bill 34 (SB 34) or Assembly Bill 13 (AB 13), or other compensation mechanism in place within the required timeframe.

- c. Mitigation Security. EDF will provide to the Service, BLM, and CDFW no fewer than 30 days prior to commencing ground-disturbing activities, an irrevocable letter of credit or another form of security (fiscal security) provided for review by the Service and BLM and approval by CDFW. The fiscal security will allow CDFW to draw on the principal sum, if CDFW at its sole discretion, determines that EDF has failed to comply with the conditions set forth herein. The fiscal security will be in the amount of \$6,561,280.00 for 2050.4 acres of land based on the following estimated costs of implementing the conservation measures: land acquisition costs for impacts to habitat, calculated at \$1,500 per acre (\$3,075,600.00); costs of enhancing acquisition lands, calculated at \$250 per acre (\$512,600.00); and long-term maintenance and management, calculated at \$1450.00 per acre (\$2,973,080.00). After completion of ground surveys within the Project additional fiscal security may be requested based on the final survey data and determination of any additional land acquisition.
- d. Compensation Land Acquisition. EDF will complete the acquisition, protection and transfer of all lands and record the required conservation easements, deed restriction, or other protection measures no later than 18 months after the start of ground-disturbing activities. The actual costs to comply with this condition will vary depending on the actual costs of acquiring compensation habitat, the costs of initially improving the habitat, and the actual costs of long-term management as determined by a Property Analysis Record (PAR) or equivalent analysis. Land acquisition will be accomplished in one of three ways:
 - i. Providing funds in an amount equivalent to the total security amount in paragraph 4 (c) into the Renewable Energy Action Team account established with National Fish Wildlife Foundation (NFWF) no later than 30 days prior to ground disturbance. Lands will be acquired no later than 18 months after ground-disturbing activity and will be conserved in perpetuity by a legal mechanism agreed to by the Service, BLM, and CDFW. EDF will independently establish a

management fund for the entity that owns and manages the acquired lands. The management fund will consist of an interest-bearing account, with the amount of capital commensurate to generate sufficient interest to fund all monitoring, management, and protection of the acquired lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and other actions designed to protect or improve the habitat values of the acquired lands. A PAR, or comparable method, will be conducted by EDF independently and reviewed by the Service, BLM, and CDFW to determine the management needs and costs described above, which then will be used to calculate the amount of capital needed for the management fund. This management fund will be held and managed by an entity approved by the Service, BLM, and CDFW as appropriate.

- ii. The responsibility for acquisition of compensation lands may be delegated to a third party other than NFWF, such as a non-governmental organization supportive of desert habitat conservation, by written agreement of the Service, BLM, and CDFW. If conservation lands are acquired by an agency-approved entity, they must meet the CDFW's fully mitigated standard. Agreements to delegate land acquisition to an approved third party, or to manage compensation lands, will be executed and implemented within 18 months of the BLM and County of Riverside's certification of the Project.
- iii. The applicant may choose to compensate for impacts to State-listed endangered species pursuant to section 2081 of the California Endangered Species Act using one or both of the "in-lieu fee" or "advance mitigation" mechanisms set forth in the State of California SB 34 and AB 13. Lands acquired through SB 34 and AB 13 may in whole or in part satisfy the habitat requirements set forth in this mitigation measure, only to the extent that they do in fact provide habitat values for significant impacts to the species and biological resources identified above, and are consistent with the selection criteria described above.

If EDF directly acquires conservation land independently, they must meet the CDFW's fully mitigated standard. Lands purchased will be transferred in fee title to CDFW, a CDFW-approved non-profit organization qualified pursuant to California Government Code section 65965, or other government entity with either a conservation easement, deed restriction, or other protective measures (as approved by CDFW) over those lands. If EDF transfers lands to CDFW, EDF will reimburse CDFW for reasonable expenses incurred during title and documentation review, expenses incurred from other State agency reviews, and overhead related to transfer of the lands. If EDF transfers lands via donation to BLM, similar transfer fees may be incurred.

5. Wildlife Impact Avoidance and Minimization (MM-WIL-1) – The applicant will minimize impacts to desert tortoise by implementing the following avoidance practices, design features, and BMPs during construction, O&M and decommissioning phases (as

applicable) of the Project. The following list of measures focuses specifically on minimizing impacts to desert tortoise.

- a. Parking and staging areas shall be enclosed by desert tortoise exclusion fencing to the fullest extent. No vehicles or construction equipment shall be moved prior to an inspection of the ground beneath the vehicle for the presence of desert tortoise or other wildlife;
- b. If a desert tortoise is observed, the designated staff will be contacted immediately and the tortoise shall be left to move on its own. If the tortoise does not move within 15 minutes, an Authorized Biologist or Biological Monitor under Authorized Biologist's direct supervision may remove and relocate the animal to a safe location if temperatures are within the range described in the *Desert Tortoise Field Manual* (Service 2009a);
- c. Vehicular traffic shall be confined to existing designated routes of travel to and from the solar facility site and gen-tie, and cross-country vehicle and equipment use outside designated work areas shall be prohibited;
- d. The speed limit shall not exceed 15 miles per hour within any part of the Project, maintenance roads for linear facilities, or unpaved access roads to the Project site where desert tortoise clearance surveys and translocations have not been completed;
- e. Prior to the onset of grading, the solar facility site will be completely fenced with security and desert tortoise exclusion fencing, including desert tortoise exclusion gates at access points. Desert tortoise exclusion fence will be securely attached to the security fence. Fence installation will be monitored by the Authorized Biologist or Biological Monitor(s) to avoid direct impacts to desert tortoise;
- f. All ground-disturbing activities conducted inside and outside of the fenced areas will be monitored by an Authorized Biologist;
- g. Water applied to dirt roads and construction areas (trenches or spoil piles) for dust abatement shall use the minimal amount needed to meet safety and air quality standards in an effort to prevent the formation of puddles, which could attract desert tortoises and common ravens to construction sites;
- h. All access roads to the solar facility site and along the gen-tie line shall be constructed such that the berms along road edges do not interfere with desert tortoise movement or trap tortoises on the roadbed. To avoid building up tall berms that may inhibit desert tortoise movement, EDF shall minimize lowering of the roadbed while grading. Berms higher than 12 inches or with a slope greater than 30 degrees shall be pulled back into the roadbed;

- i. Facility lighting shall be designed, installed, and maintained to prevent side casting of light;
 - j. Any construction pipe, culvert, or similar structure with a diameter greater than 3 inches, stored less than 8 inches aboveground for one or more nights, shall be inspected for tortoises before the material is moved, buried, or capped. As an alternative, all such structures may be capped before being stored outside the fenced area, or placed on pipe racks;
 - k. At the end of each work day, the Authorized Biologist shall ensure that all potential wildlife pitfalls (i.e., trenches, bores, temporary detention basins, and other excavations) have been backfilled. If backfilling is not feasible, all trenches, bores, temporary detention basins, and other excavations shall be sloped at a 3:1 ratio at the ends to provide wildlife escape ramps, or covered completely to prevent wildlife access, or fully enclosed with desert tortoise-exclusion fencing;
 - l. All trash and food-related waste shall be placed in self-closing raven-proof containers and removed daily from the Project during the construction phase, and as regularly as necessary during O&M to prevent overflow. EDF will immediately remove any road kill observed on Project roads to minimize the attractiveness of the area to predators and other scavengers; and
 - m. Prior to any discharge into the onsite evaporation ponds, enXco shall cover the ponds with 1.5-inch mesh netting, or other effective exclusion material (e.g., armor balls) to exclude birds and other wildlife from drinking from the pond surface. Additionally, a small-mesh wildlife exclusion fence shall be placed around the entire perimeter of the pond fence, including gates, to prevent small animals from accessing the pond.
6. Desert Tortoise Clearance Surveys and Exclusion Fencing (MM-WIL-2) – The applicant will avoid and minimize impacts to desert tortoises by (1) fencing the solar facility site to prevent tortoises from entering it during construction, O&M, or decommissioning; (2) removing all tortoises from within the fenced perimeter of the site prior to initiating construction; and (3) translocating tortoises to an appropriate offsite location, as identified in the Desert Tortoise Translocation Plan for the Project. Methods for clearance surveys, fence specification and installation, tortoise handling, artificial burrow construction, egg handling, and other procedures shall be consistent with those described in the Service *Desert Tortoise Field Manual* (2009a) or more current guidance provided by CDFW and Service. Following construction of the tortoise exclusion fencing, the fenced area shall be cleared of tortoises by the Authorized Biologist and Biological Monitor(s). Clearance surveys shall be conducted in accordance with the Service 2009 *Desert Tortoise Field Manual* (Chapter 6, Clearance Survey Protocol for the Desert Tortoise – Mojave Population) and shall consist of at least two surveys covering 100 percent of the enclosed area by walking transects no more than 15 feet apart. Surveys shall be repeated until two consecutive 100 percent coverage surveys are completed without finding live tortoises.

Any tortoises (adult, sub adult or juvenile) or eggs located during clearance surveys shall be translocated and monitored in accordance with the Desert Tortoise Translocation Plan. Following the desert tortoise clearance surveys, the Authorized Biologist and Biological Monitor(s) shall monitor vegetation clearing and grading activities within the fenced area to find and translocate any tortoises which may have been missed during the clearance surveys. Permanent fencing shall be inspected monthly and within 24 hours following all major rains.

7. Desert Tortoise Translocation Plan (MM-WIL-2) – A draft Desert Tortoise Translocation Plan has been prepared to describe the translocation effort for the Project. The goals of the translocation plan are to safely exclude desert tortoises from within the Project, translocate them to appropriate locations offsite, minimize stress and potential for disease transmission, and assess the effectiveness of the translocation effort through a long-term monitoring program. The draft translocation plan includes protective measures, designates primary and alternative recipient sites, and provides provisions for expanded monitoring for translocation in the event that the Project site has more than five tortoises, including a control site. If five or fewer adult and subadult tortoises will be translocated, then EDF will not be responsible for long-term post-translocation monitoring or a control site. The Authorized Biologist will recommend a disposition plan for each tortoise found and submit the plans to the Service, BLM, and CDFW for concurrence prior to moving any desert tortoises. Each disposition plan will include the visual health assessment and upper respiratory tract disease (URTD) test results. Desert tortoises will not be taken off site without an approved disposition plan. Radio transmitters placed during clearance surveys may be removed after agency concurrence or at the direction of the Service, BLM, and CDFW, or left in place to allow follow-up monitoring by the agencies.

If a clutch of eggs is located during preconstruction clearance surveys, the location will be recorded and the nest will be monitored daily from a distance, using binoculars, to prevent the possibility of identifying the nest to avian or canid predators. The Authorized Biologist will contact the Service, CDFW, and BLM to determine the best course of action, depending on date, vulnerability to predation, and construction schedule. The eggs may be left in place to hatch, or may be collected and translocated. If the eggs do not hatch in place, they will be inspected to determine if they are viable. If so, the Authorized Biologist will translocate them to a replacement nest in a comparable micro-area (e.g., cover, project species, soil type, substrate, and aspect) at the recipient site, in accordance with the Service *Desert Tortoise Field Manual* (2009a). Translocated nests will be fenced with sturdy open-mesh fencing (e.g., 2-inch wide chain link mesh) that will permit hatchlings to escape but prevent depredation by canids that might be attracted to the new nests by human scent. Open-mesh fencing or avian netting also will be installed on the roof to prevent predator entry. The replacement nest location(s) will be added to the long-term monitoring program.

If hatchling or juvenile desert tortoises measuring less than 120 millimeter midline carapace length or weighing less than 100 grams (i.e., too small for marking, radio

transmitters, or blood collection) are located during clearance surveys, they will be carefully collected from the field and maintained in separate disinfected containers either indoors or in on-site quarantine enclosures, depending on season, temperatures, and anticipated holding time. The Authorized Biologist will contact the Service, CDFW, and BLM to determine the best course of action.

For tortoises that may be found along linear features (fencing, gen-tie line, and access roads), the Plan's goal is to avoid impacts through construction monitoring, allowing the tortoise to leave the work area, moving it out of harm's way if required and as permitted by the biological opinion, and avoiding disturbance to tortoise burrows through re-siting work sites and structures. The final Desert Tortoise Translocation Plan will be reviewed and approved by the Service, BLM, and CDFW prior to implementation.

8. Raven Management Plan (MM-WIL-8) – A draft Raven Monitoring, Management and Control Plan (Raven Plan) has been prepared by a qualified biologist using the most current Service raven management guidelines. The plan shall be reviewed and approved by the Service, BLM, and CDFW. The purpose of the Raven Plan will be to minimize project-related predator subsidies and prevent any increases in raven numbers or activity during construction, O&M, and decommissioning. The Plan will address all Project components and their potential effects on raven numbers and activity. The threshold for implementation of raven control measures will be any increases in raven numbers from baseline conditions, as detected by monitoring to be implemented pursuant to the Raven Plan. Regardless of raven monitoring results, EDF will be responsible for all other aspects of raven management described in the Raven Plan, including avoidance and minimization of project-related trash, water sources, or perch/roost sites that could contribute to increased raven numbers, throughout the life of the Project, including construction, O&M, and decommissioning. In addition, to offset the cumulative contributions of the Project to adverse impacts to desert tortoise from increased raven numbers, EDF will contribute to the Service's Regional Raven Management Program.
9. Vegetation Resources Management Plan (MM-VEG-5) – The Vegetation Resources Management Plan will detail the methods for vegetation of temporarily impacted sites; salvage of cacti and special-status plants from the Project footprint; and long-term management of vegetation within the solar facility during its operations. The Vegetation Resources Management Plan will be approved by BLM in writing prior to the initiation of any vegetation-disturbing activities.
10. Integrated Weed Management Plan (MM-VEG-9) – The draft IWMP has been developed and is subject to approval by the BLM. The IWMP provides a pre-project assessment of nonnative and invasive plants that occur on site, an assessment of those that could be introduced into the Project, and a description of the methods to be used to survey for the presence of introduced weeds during construction and operation. The IWMP also includes the monitoring and weed control methods to be employed during operation, specific and detailed guidelines for herbicide use to prevent overspray onto surrounding areas where it

would adversely affect wildlife or native plants, and reporting requirements. The IWMP also contains a list of BMPs to prevent the spread and propagation of weeds during all phases of the Project. Methods outlined in the IWMP are consistent with BLM's Vegetation Treatments Using Herbicides on BLM Lands in 17 western States (BLM 2007) and the National Invasive Species Management Plan (NISC 2008).

11. Fugitive Dust Control Plan (MM-AQ-1) – The applicant will prepare and implement a Fugitive Dust Control Plan incorporating appropriate BMPs for management of dust during construction activities.
12. Decommissioning Plan (MM-HAZ-10) – When permanent closure is appropriate, a Decommissioning Plan would be developed prior to the facility closure based on conditions at that time. The plan will be submitted to the BLM for review and approval.

Action Area

The implementing regulations to section 7(a)(2) of the Act describe the action area to be all areas affected directly or indirectly by the Federal action and not merely the immediate area affected by the Project (50 CFR § 402.02). The action area is the area of potential direct or indirect effects of the proposed action and any interrelated or interdependent human activities; the direct and indirect effects of these activities include associated physical, chemical, and/or biological effects of considerable likelihood (Service and NMFS 1998). Indirect effects are those that are caused by the proposed action and are later in time but are still reasonably certain to occur (50 CFR § 402.02, Service and NMFS 1986). Analyses of the environmental baseline, effects of the action on the species and designated critical habitat, cumulative effects, and the impacts of the incidental taking, are based upon the action area as determined by the Service (Service and NMFS 1998).

The action area proposed by BLM (2012) for the Project includes the solar generation facility site, access roads, and gen-tie line alignment, including a 1-mile buffer around the solar plant facility and a 1,640-foot buffer on each side of the centerline of the gen-tie line to account for the area within which tortoises may be moved out of harm's way during construction of linear Project components and any indirect effects of the proposed action (Figure 3). The buffer area was included to address adverse effects to desert tortoises whose home ranges overlap the proposed solar facility. Based on the assumption that the average male home range is approximately 77 mile² (O'Conner et al. 1994, Duda et al. 1999, Harless et al. 2009), the buffer around the Project site is likely to capture a tortoise home range that may overlap the proposed facility. However, we recognize that the size of desert tortoise home ranges varies with respect to location and year (Berry 1986) and the size serves as an indicator of resource availability and opportunity for reproduction and social interactions (O'Connor et al. 1994). Over the course of their lifetime tortoises may use more than 1.5 mile² of habitat and make forays of several miles at a time (Service 2010c).

The total buffered action area equals approximately 14,079 acres (Figure 3), including EDF's proposed offsite O&M facility. For the purposes of this biological opinion, the Project site is defined as the area inside and outside of the permanent fence that would be disturbed due to construction or O&M activities on the Project components.

The action area also includes the proposed desert tortoise recipient (translocation) site for any tortoises moved greater than 1,640 feet. Based on pre-project survey data and our analysis, we do not anticipate that this Project will need both a primary recipient site and a control site¹. Therefore, only the primary recipient site is included as part of the action area and effects analysis. The primary translocation site is the 3,986-acre Sunlight Recipient Site located 2.3 miles northwest from proposed solar facility. The recipient site encompasses the area within a 4-mile radius of the set release point to address areas where desert tortoises may move following translocation.²

Finally, the action area encompasses lands that would be acquired to offset the loss of desert tortoise habitat resulting from construction and O&M of the Project. The acquisition, management, and monitoring of these conservation areas are expected to have beneficial effects to desert tortoises; however, the specific locations of these lands are currently unknown. Acquisition priorities would be along the I-10 corridor between Cactus City and Desert Center, where existing crossings could be utilized to access contiguous desert tortoise habitats through the Upper Chuckwalla Valley into Joshua Tree National Park. Between 1,254 to 1,300 acres of suitable desert tortoise habitat would be acquired within the Desert Tortoise Connectivity Corridor.

STATUS OF THE SPECIES AND CRITICAL HABITAT RANGEWIDE

The following section summarizes information about the desert tortoise on the legal/listing status, distribution and population trends, current threats, and status of critical habitat as discussed in the Service's revised recovery plan (Service 2011b), the current 5-year review (Service 2010c), and the biological opinion on Desert Sunlight Solar Farm (Service 2011a). Please see these documents for additional detailed information about these topics and the species' description, life history, and habitat affinities.

Legal/Listing Status

The Mojave population of desert tortoise was proposed for listing by the Service on October 13, 1989, and listed as a threatened species on April 2, 1990 (Service 1989, 1990). The tortoise is also listed as a threatened species under the California Endangered Species Act. The Service designated about 6.5 million acres of critical habitat for the desert tortoise in portions of California, Nevada, Arizona, and Utah on February 8, 1994 (Service 1994b). The

¹ Translocation of more than five tortoises from the Project site (cumulative number) triggers the full translocation guidance, which includes identifying a suitable control site and a long-term monitoring program (Service 2010a).

² See "Effects of the Action" section for a discussion on post-translocation dispersal.

recovery plan was approved in 1994 (Service 1994a). A revised recovery plan was published in 2011 (Service 2011b).

Since listing, the desert tortoise has been split into two species, *Gopherus agassizii* and *G. morafkai*. The newly defined *G. agassizii*, or Mojave desert tortoise, is analogous to the listed entity, and thus the taxonomic revision does not affect its listing status. For more information on the revision and the listed species, please see Murphy et al. (2011), and Averill-Murray (2011).

Distribution and Population Trends

Desert tortoise habitat in the Mojave Desert is characterized as creosote bush scrub below 5,500 feet in which precipitation ranges from 2 to 8 inches, where production of annual plants is high. Desert tortoises are also found in areas where the diversity of perennial plants is relatively high. The desert tortoise ranges north and west of the Colorado River in the Mojave Desert of California, Nevada, Arizona, and southwestern Utah, and in the Sonoran/Colorado Desert of California.

Since 2001, line distance sampling has been used as part of a long-term monitoring strategy to detect population trends. Density estimates of adult tortoises vary among recovery units and years. Detecting population trends is expected to be a gradual process and surveys conducted over short periods of time, such as the time since program initiation, would only be expected to reveal catastrophic declines or significant changes. In general, over the first 6 years of rangewide monitoring (2001-2005, 2007), tortoises were least abundant in the Northeast Mojave Desert Recovery Unit, the highest reported densities occurred in the Upper Virgin River Recovery Unit, and considerable decreases in density were reported in 2003 in the Eastern Colorado and Western Mojave recovery units (Service 2011b). The Chuckwalla DWMA has one of the highest densities of tortoises range wide (Service 2009b).

The Project is within the former Eastern Colorado Recovery Unit (Service 1994a), which was consolidated with the Northern Colorado Unit to form the Colorado Desert Recovery Unit in the revised recovery plan (Service 2011b). Based on long-term monitoring strata from 2001 to 2007, density within the former Eastern Colorado Recovery Unit is estimated to be between 13.0 and 26.2 adult and subadult tortoises per mile². Density within the Colorado Desert Recovery Unit is estimated at 13.8 tortoises per mile² which is derived from mean densities from 2007-2010 within the DWMAs and other conservation areas (Service 2011c). However, this estimate is across the entire recovery unit, which has patches of varying densities (Service 2011b).

Current Threats

The majority of threats to the tortoise and its habitat are associated with human land use changes. Threats include urbanization, upper respiratory tract disease and possibly other diseases, predation by common ravens (*Corvus corax*) and domestic and feral dogs, unauthorized off-highway vehicle (OHV) activity, authorized vehicular activity, illegal collecting, mortality on

paved roads, vandalism, drought, livestock grazing, feral burros, nonnative plants, changes to natural fire regimes, and environmental contaminants. For further discussion of individual threats, please see the revised recovery plan (Service 2011b) and the most recent 5-year review (Service 2010c). Since release of the 5-year review, utility-scale renewable energy development has become a greater threat to the desert tortoise. These threats include habitat loss and fragmentation, raven predation and transmission line construction, collision with vehicles using new roads, and disturbance associated with renewable energy development. For a detailed discussion of current energy projects and impacts to tortoise habitat, populations, and connectivity in the Colorado Desert Recovery Unit, please see the Desert Sunlight biological opinion (Service 2011a).

Land Uses in the Vicinity of the Action Area

The areas surrounding the project consist of primarily publicly managed lands interspersed with smaller private parcels on the south and east of the project. BLM owns and manages substantial acreage within the project vicinity, including the Palen Ford WHMA, Desert Lily Preserve Area of Critical Environmental Concern (ACEC) and Alligator Rock ACEC. A few miles from the project site, Joshua Tree National Park, encompasses nearly 800,000 acres, including approximately 585,000 acres of federally designated wilderness. The Park has an active management and monitoring program for desert tortoise and conserves extensive acreage of minimally disturbed habitat.

A number of easements exist on the land within the project vicinity and action area, including transmission lines, telephone lines, pipelines, and railroads, and FERC transmission withdrawal lands, water transmission facilities and mining claims also exist in and around the action area.

Numerous sources of water exist in the project vicinity. Desert Center and Lake Tamarisk are located south of the action area. Lake Tamarisk, a RV and golf community is unfenced and open to wildlife as well as birds. The Eagle Mountain Pumping Station, north of the project along Eagle Mountain Road, and the above-ground portions of the Colorado River aqueduct are both fenced to prevent access to non-avian wildlife. Additionally, there are some active and inactive agriculture within the action area and general vicinity.

Access to the Project is provided by Kaiser Road, which runs north-south between I-10 and the solar facility. Kaiser Road is the main road leading to the Eagle Mountain Pump Storage Hydroelectric Project and the recently approved 4,176-acre Desert Sunlight Solar Farm Project (Service 2011a). Eagle Mountain Road, west of Kaiser Road is the main entrance to the Colorado River aqueduct pumping station and is closed to the public for a portion of its length.

Status of the Species in the Vicinity of the Action Area

Tortoise distribution in the project vicinity is constrained by a number of variables. Connectivity is a primary concern in the western Chuckwalla Valley and Pinto Wash (Service 2011a). In this area, development and abandoned agriculture combine with the naturally constraining features of

the rugged Eagle Mountains to the west and hot, dry open areas to the east to constrict potential tortoise habitat to a “pinch point” corridor approximately 1 mile wide. A desert tortoise may use more than 1.5 square miles of habitat and make periodic forays of more than 7 miles at a time over its lifetime (Berry 1986). The viability of the linkages is based on the ability of those linkages to maintain the lifetime home range of a desert tortoise or the ability of home ranges of this size to connect to one another absent any barriers. Because we expect lifetime home ranges to expand and contract over time, we can consider whether the linkage could remain viable in a year where decreased resource availability results in a smaller population that responds by expanding their home ranges. The action area is south of the linkage between the Upper Chuckwalla Valley and Pinto Basin and connects the populations in the Chuckwalla CHU and DWMA with populations in Joshua Tree National Park, Pinto Mountain CHU, Chemehuevi CHU and DWMA, and thence the Mojave Desert portion of the species’ range.

Status of Critical Habitat Rangewide

The Service designated about 6.5 million acres of critical habitat for the tortoise in portions of California, Nevada, Arizona, and Utah (Service 1994b). Designated critical habitat occurs in the southeastern extent of the action area adjacent to the gen-tie transmission line. Critical habitat is characterized by six primary constituent elements (PCEs).

Threats to critical habitat include urban development, military operations, OHV activities, and livestock grazing (Service 1994b). The spread of invasive nonnative plants, changes to natural fire regimes, and environmental contaminants also threaten critical habitat areas. In addition, threats from long-term climate trends, such as recurrent and prolonged drought, and ecological processes, such as invasive nonnative plant infestations and consequent wildfire risk, are widespread in some areas. These threats have potentially degraded the PCEs of desert tortoise critical habitat in some areas and if continued could threaten the viability of populations in affected areas, including habitat linkages between core populations (Service 1994b).

ENVIRONMENTAL BASELINE OF THE SPECIES AND CRITICAL HABITAT

Regulations implementing the Act (50 CFR § 402.02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the action area. Also included in the environmental baseline are the anticipated impacts of all proposed Federal projects in the action area that have undergone section 7 consultation, and the impacts of State and private actions which are contemporaneous with the consultation in progress.

Past Consultations in the Action Area

The Service has issued the following biological opinions for actions that have occurred or will occur within the action area for this consultation. In all cases, the Service determined that the

proposed action was not likely to jeopardize the continued existence of the desert tortoise or destroy or adversely modify its critical habitat.

Solar Energy Development Programmatic Environmental Impact Statement (PEIS)

The Service issued a programmatic biological opinion to BLM on July 20, 2012, regarding the landscape level effects of designating Solar Energy Zones (SEZs) and amending land use plans in six southwestern States (i.e., Arizona, California, Colorado, Nevada, New Mexico, and Utah) (FWS-AES-DCHRS-052135). The amendments would exclude certain areas from availability for utility-scale solar energy development, identify SEZs within which utility-scale solar energy development would be a priority use, and establish design features that would be applicable to all future utility-scale solar energy development on BLM-administered lands. Seventeen SEZs are proposed comprising about 285,000 acres.

The Riverside East SEZ is the largest of the proposed SEZs in the six-State action area, with a total developable area of 147,910 acres. The Riverside East SEZ occurs in the Colorado Desert Recovery Unit for the desert tortoise and is immediately adjacent to the Joshua Tree National Park and Chuckwalla DWMA. The proposed SEZ is known to support occupied and suitable desert tortoise habitats.

This programmatic biological opinion was prepared in accordance with the July 16, 2003, guidance for programmatic-level consultations (Service 2003). The Solar PEIS will guide the processing of all new utility-scale solar energy applications on BLM-administered lands. The BLM defines “new” applications as any applications filed within proposed SEZs after June 30, 2009, and any applications filed within proposed variance and/or exclusion areas after the October 28, 2011, publication of the supplement to the draft Solar PEIS. Solar projects within the SEZ are subject to consultation and will be examined for effect to listed species and critical habitat and where appropriate will be subject to the consultation requirements of section 7.

Desert Sunlight Solar Farm and Red Bluff Substation Project

The Service issued a biological opinion on July 6, 2011, to BLM for their proposed issuance of a ROW grant that would authorize the construction, operation, and maintenance of the proposed Desert Sunlight Solar Farm project and generation intertie connection. The Service analyzed two gen-tie alignments in the biological opinion (Desert Sunlight EIS Alternatives A-1 and A-2, corresponding to Alternatives B and D of the Desert Harvest DEIS) The gen-tie alignments cross portions of the designated Chuckwalla Critical Habitat Unit (CHU) and BLM’s Chuckwalla DWMA/ACEC, which are special management areas for desert tortoise. The gen-tie alignments would respectively affect approximately 34 and 14 acres of the Chuckwalla CHU and 37 and 11 acres of the Chuckwalla DWMA. The BLM also proposed to issue a ROW grant for the construction, operation, and maintenance of the SCE Red Bluff Substation and associated components (FWS-ERIV-08B0789-11F0041). The two projects are sited on approximately

4,000 acres and 172 acres of BLM-managed lands, respectively. The solar generation facility is located in Riverside County approximately 6 miles north of the rural community of Desert Center and approximately 6.5 miles north of the I-10 corridor.

Take was exempted for the up to 35 subadult and adult tortoises, 25 juveniles, and 129 eggs that could occur in the solar facility and substation project footprints. Based on best professional judgment in light of best available information, we anticipate that construction of this project will result in the incidental take of three individuals and that O&M activities will result in incidental take of three individuals per year. We also exempted take in the form of trapping, capture, or collection of up to 114 subadult and adult tortoises for the purposes of blood draw to assess disease prevalence within the translocated and resident populations. In addition, take in the form of capture or collection was exempted for up to 31 subadult and adult and 25 juveniles at a control site, should one be required, for post-translocation monitoring.

Direct loss of designated critical habitat for desert tortoise was determined negligible relative to the 1,020,600 acres of critical habitat designated within the Chuckwalla CHU. The Service determined that impacts associated with the gen-tie are not likely to appreciably diminish the value of the PCEs essential to the species' recovery within the Chuckwalla CHU.

NECO Coordinated Management Plan Amendment

To provide for management of recreational use, and to resolve other resource and public land use conflicts, section 602(d) of Federal Land Policy and Management Act of 1976 directed the Secretary of the Interior to "prepare and implement a comprehensive, long-range plan for management use, development, and protection of the public lands within the CDCA". The CDCA Plan is an over-arching or programmatic plan from which activity-level or more site-specific plans are tiered. The NECO Plan is an amendment to the 1980 CDCA Plan.

The Service issued a programmatic biological opinion evaluating the effects of BLM's CDCA Plan Amendment for the BLM's NECO Plan (BLM 2002) on desert tortoise and its critical habitat on June 17, 2002 (1-8-01-F-16), and as amended, on March 31, 2005, and November 30, 2007 (1-8-04-F-43R). We found the BLM's plan guidance was not likely to jeopardize the continued existence of desert tortoise or adversely modify its critical habitat. The programmatic biological opinion exempted take of desert tortoise for casual uses (e.g., recreation, mining, and OHV use), livestock grazing, and burro removal that BLM authorizes through approval of the CDCA Plan. Projects outside of these activity categories require separate consultation.

In sum, the biological opinions listed above have authorized a relatively small amount of take within the large areas that they cover. Implementation of conservation measures similar to those included in this biological opinion minimizes the associated adverse effects and impacts of the taking of desert tortoise and impacts to critical habitat. Because the action areas defined for these projects narrowly intersect that which is analyzed for the Project in this biological opinion,

only a relatively small portion of the total take associated with these projects would coincide geographically with the Project. However, the collective effect of these various project approvals has (1) reduced the number of opportunities for desert tortoises to cross the I-10 corridor and maintain landscape-level population connectivity between the Mojave and Colorado portions of the species' range; and (2) likely reduced desert tortoise population levels in portions of the action area, which reduces the extent of population connectivity to an unknown degree. Consequently, we conclude that the environmental baseline against which the effects of the Project are analyzed include habitat areas that have been degraded by existing land uses and will experience additional reductions once projects that have been approved are constructed.

Habitat Characteristics of the Action Area

The Project encompasses over 5 million acres and is within the CDCA NECO planning area, which includes the Chuckwalla CHU and DWMA and Chemehuevi CHU and DWMA (BLM 2002). For the land management decisions, the CDCA designated four multiple use classes (BLM 1999). The proposed solar facility and most of the proposed gen-tie line would be located on BLM Class M (moderate/multiple use) lands. Part of the northern boundary of the solar facility site, approximately 47 acres, is proposed within the Palen-Ford WHMA. Management emphasis for this WHMA is on the dunes and playas within the Palen-Ford dune system (BLM 2012). Desert tortoise habitat in Class M lands were excluded from designated DWMA's based on the assumption that these areas generally supported low to medium tortoise densities, though survey data were unavailable for most areas. However, since the NECO Plan was approved, considerably more data have been obtained relative to desert tortoise population genetics, importance of particular habitat areas for connectivity, species occurrence and densities within the Colorado Desert, and threats to the species throughout its range (Service 2011b), including the extent of renewable energy development now proposed in the plan area.

The applicant conducted various surveys to determine baseline conditions and characterize the vegetative communities within the action area. The information presented below is a synopsis found in the biological assessment report (Aspen Environmental 2012a), the biological technical report (Aspen Environmental 2012b), and the DEIS (BLM 2012). For the habitat characterization of the proposed gen-tie line route, the applicant is utilizing data from the surveys conducted by Desert Sunlight (Ironwood Consulting 2010).

The Project site is composed primarily of two vegetation types: creosote bush scrub (*Larrea tridentata* Shrubland Alliance), and blue palo verde–ironwood woodland (*Parkinsonia florida-Olneya tesota* Woodland Alliance) (Sawyer et al. 2009). Creosote bush scrub is a subset of the Sonoran creosote bush scrub as described by Holland (1986), and blue palo verde–ironwood woodland is a subset of Holland's description of desert dry wash woodland. Most of the action area is characterized as creosote bush scrub, which is composed of creosote bush (*Larrea tridentata*), white bursage (*Ambrosia dumosa*), brittlebush (*Encelia farinosa*), and big galleta (*Hilaria rigida*). This community is also found in the upper portions of the Metropolitan Water District (MWD) spillway, which intersects the northern and southern parcel. Additionally, the site has some desert pavement with relatively sparse cover and other are small areas where

natural vegetation has been removed or disturbed for roads and other land uses (Aspen Environmental Group 2012a).

The desert dry wash woodland community is characterized by drought-deciduous, small-leaved leguminous trees. The dry washes are often braided channels which are highly variable during flow events. Blue palo verde–ironwood woodland is scattered throughout the Project, but trees are also concentrated within the dry washes that extends from the border of the northern and southern parcel leading to the MWD spillway. This vegetation type is characterized by the presence of desert ironwood (*Olneya tesota*) and blue palo verde (*Parkinsonia florida*) (Aspen Environmental Group 2012a). Vegetation in desert dry washes is generally taller, up to approximately 30 feet in height, and denser than those of surrounding desert habitats, with the height of the wash vegetation proportional to the size of the arroyo (Laudenslayer 1988). Understory vegetation within these woodlands is composed of species like big galleta, cheesebush (*Hymenoclea salsola*), and desert lavender (*Hyptis emoryi*). BLM and CDFW consider this community type sensitive due its limited distribution, value to wildlife, and susceptibility to disturbance (BLM 2002, California Department of Fish and Game 2010). The total area of blue palo verde–ironwood woodland within the Project is approximately 180 acres (Aspen Environmental Group 2012a).

While invasive plant species were documented, the overall prevalence of invasive species is low and the density on site is consistent with the regional upland landscape and undisturbed bajadas. Invasive plant species found on the project site and in the surrounding areas include Mediterranean grass (*Schismus arabicus*), red brome (*Bromus madritensis* subsp. *rubens*), storksbill (*Erodium cicutarium*), Sahara mustard (*Brassica tournefortii*), London rocket (*Sisymbrium irio*), and Russian thistle (*Salsola tragus*) (Aspen Environmental Group 2012a).

Habitat characteristics of the proposed recipient site are similar to the habitats described above. In general, the Sunlight Recipient Site is comprised of creosote scrub vegetation and desert dry wash woodlands. The Sunlight Recipient Site is located on BLM-managed lands within the Colorado Desert Recovery Unit for the desert tortoise that BLM has committed to managing as a solar exclusion area (Aspen Environmental Group 2012d).

The action area supports occupied and suitable habitat, but the site is generally lower in elevation with hotter, drier climes and with less friable soils moving east towards the Palen-Ford Dry Lake sand transport system. Active and fallow agriculture and other land uses and activities in the region have constrained the habitat available to desert tortoises. The approved Desert Sunlight Solar Farm project, adjacent to the Project site to the north, is now under construction further reducing available habitat.

Status of the Species within the Action Area

Focused surveys for desert tortoise were conducted for the northeastern parcel during spring 2010 and the smaller and the southwestern parcel in spring 2011 in accordance with Service survey protocol (Aspen Environmental Group 2012a). Three parallel belt transects were also

conducted around the perimeter for each parcel. While no tortoises were identified in the Project site during surveys, tortoises are known to occur within the action area as indicated from survey results from adjacent Desert Sunlight project, Chuckwalla Recipient Site, and along the proposed shared gen-tie route (Service 2011a).

The U.S. Geological Survey (USGS) developed a quantitative habitat model for the Mojave desert tortoise, which includes portions of the Colorado Desert in California (Nussear et al. 2009). Based on field collected presence data, the model provides a measure of the statistical probability of habitat potential for desert tortoise. To date, the USGS model is viewed as the best available data for predicting desert tortoise habitat on a landscape scale, though it does not account for site-specific and anthropogenic conditions across the landscape that affect habitat potential at a local scale. In addition, monitoring efforts and collection of presence data have focused mainly within CHUs, DWMAs, and other lands allocated for conservation.

USGS-modeled habitat within the action area and vicinity is shown on Figure 4. The model is a predictive tool used for mapping the potential distribution of desert tortoise habitat and it is not intended to be used, or viewed, as a substitute for ground-based, site-specific field surveys. (Aspen Environmental Group 2012a, Nussear et al. 2009). Additionally, the model has certain limitations and there are likely areas of potential habitat for which habitat index potential was not predicted to be high, and likewise areas of potential habitat for which the model predicted higher potential (Nussear et al. 2009). Field surveys indicated tortoise presence within the project boundary based on one class 3 burrow³ found on the western corner of the northwestern parcel and a class 2 burrow³ located on the eastern boundary of the northwestern parcel of the project. Five class 5 burrows³ were found within the southeastern parcel (Aspen Environmental Group 2012b). Figure 5 shows the USGS tortoise habitat model and results from the project specific field surveys for Desert Harvest and Desert Sunlight tortoise protocol surveys within the action area (Ironwood Consulting 2010). Previous surveys of the action area indicate live animals, active burrows, and sign within predicted lower quality habitat (Figure 5).

Protocol surveys are used to determine tortoise presence and calculate tortoise density. To estimate the number of tortoises, we applied the method for estimating tortoises described in the 2010 survey protocol (Service 2010b). The calculation is based on the observation of live tortoises during pre-project surveys; however, pre-project surveys for the Desert Harvest Project did not detect live tortoises and indicated tortoise sign only. During unfavorable periods tortoises decrease activity, change burrow use, and remain inactive or dormant (Duda et al. 1999). Given that tortoise surveys represent a snapshot in time and the size and location of

³ Desert Tortoise Burrow Condition Class (Service 2009a) :

1. Currently active, with desert tortoise or recent desert tortoise sign
2. Good condition, definitely desert tortoise; no evidence of recent use
3. Deteriorated condition; this includes collapsed burrows; definitely desert tortoise
4. Good condition; possibly desert tortoise
5. Deteriorated condition; this includes collapsed burrows; possibly desert tortoise

desert tortoise home ranges vary year to year (Berry 1986), we assumed that at least one tortoise may still be using the Project as a part of their home range, as indicated by the presence of good condition (class 2) burrows, and the results of protocol surveys conducted by Desert Sunlight which show both sign and live animals within the action area and 0.50-mile of the project boundary (Figure 5). We also acknowledge that seven tortoises have been cleared from the Desert Sunlight and individual animals identified by Desert Sunlight's pre-project surveys may have already been removed from their home range which may overlap the action area. Based on the assumption that one tortoise is using the Project as a part of their home range, our calculation yields an estimate of two subadults or adult tortoises. This estimate is based both on previous winter rainfall and the probability that a tortoise is above ground during a survey (see Service 2010c). The Service's method for estimating tortoise numbers (Service 2010b) also allows us to calculate a 95-percent confidence interval used to indicate the reliability of the data. We based our calculation on assumptions, not actual live animals or Project survey data and therefore, cannot determine the reliability of the estimate.

An alternative method of calculating density within the Project is to apply the calculation used in the amended biological opinion for the CDCA for the NECO planning areas. To derive density of desert tortoises outside the DWMAs and critical habitat within the Colorado Desert Recovery Unit, we multiplied the average density of desert tortoises in the recovery units by 10 percent (Service 2007). This calculation is based on our professional opinion that densities outside DWMAs, tortoise conservation areas and critical habitat are generally lower based on numerous factors and habitat conditions, including elevation, rainfall, vegetation community composition, and other geographic variables which lead to supporting fewer animals. Density of tortoises at the recovery unit level is based on line-distance sampling from 2001 to 2005, and again from 2007 through 2010. Mean density for the Colorado Desert Recovery Unit is 13.8 tortoises per mile², which is derived from an average of the densities within the DWMAs and other tortoise conservation areas (Service 2011c). Applying this density of tortoises (1.38 per mile²) to the solar facility footprint (1,208 acres or 1.89 mile²), yields a rounded estimate of three subadult or adult tortoise in the project footprint.

Using these two methods, we anticipate that two to three subadult or adult tortoises may occur in the solar facility footprint. We acknowledge that the estimate may be an overestimate since it is based on our assumptions of tortoise densities outside of DWMAs and critical habitat or our assumptions of desert tortoise occupancy after evaluating pre-project survey results of the project site and previous surveys that overlap the action area. However, we determined that applying the estimate of three tortoises in the project footprint would provide a biologically conservative approach based on the best data available to establish a baseline for analysis of the potential impacts of the Project.

In addition to subadult and adult desert tortoises, the Project likely supports juvenile desert tortoises (i.e., less than 6.3 inch) and eggs. Estimating densities of juvenile desert tortoises is difficult because of low detection probabilities due to their small size and cryptic nature. However, based on a 4-year study of their population ecology, Turner et al. (1987) determined that juveniles accounted for 31 to 51 percent of the overall population. Using this range and the

estimated maximum of three subadults or adult tortoises within the project site, we estimate that the project footprint may support up to two juveniles. We recognize that the survey data used for this estimate come from a limited number of studies and that population levels are constantly changing. Because our estimate of the number of subadult or adult tortoises in the Project is based on assumptions discussed above, the estimate of the number of juveniles may be an overestimate as well, but provides the best available data to establish a baseline for analysis.

We also expect the Project to support desert tortoise eggs. Estimating the number of tortoise eggs is extremely difficult given that the eggs are buried beneath the soil surface. To estimate the number of eggs that could be present on site, we used the mean clutch size of 5.38 eggs per clutch (Turner et al. 1986 in Service 1994a) and a mean number of clutches of 1.6 per female per year (Turner et al. 1984). Assuming a 1:1 sex ratio (Turner et al. 1984, 1987), we estimated that at least one desert tortoise within the project site may be a reproductive female and that she could produce approximately up to nine eggs per year. Applying these assumptions (i.e., the sex ratio, mean clutch size, and mean number of clutches per female per year are comparable to those observed by Turner et al. (1984)) to estimate the number of eggs on the Project site has an unknown but high level of uncertainty given the number of assumptions and extrapolations used to estimate the number of eggs. Therefore, we cannot calculate a reliable estimate for the number of eggs that may be impacted by the Project.

While a recent landscape genetics study (Hagerty et al. 2011) confirmed that “habitat within the Mojave population of the desert tortoise was well connected,” this connectivity should be maintained by minimizing the severing of genetic linkages between tortoise conservation areas, like DWMAs (Service 2011b). Using data from the USGS habitat model (Nussear et al. 2009), some desert tortoise populations within conservation areas in the Mojave and Colorado desert portions of the range now appear to be connected by constricted linkages supporting suitable habitat. These linkages include a narrow corridor along Cottonwood Wash at the southern entrance to Joshua Tree National Park (with resident desert tortoises occupying areas along narrow sections of the canyon) and through the Pinto Wash between the Eagle and Coxcomb mountains (see “Effects of Impacts to Habitat and Population Connectivity” section below for details on the viability of these linkages).

Proposed Recipient Sites

As recommended in the Service’s translocation guidance, three potential recipient sites for the project site were identified; Sunlight, Chuckwalla, and DuPont. Because the Chuckwalla Recipient Site was selected during the drafting of this opinion as a control site for the Project, this location cannot be used as a recipient site. Moreover, because we do not anticipate more than three tortoises will need translocation, only the primary site (i.e., Sunlight Recipient Site) is included as part of the action area and effects analysis for translocation of those animals found greater than 1,640 feet from the fence of the solar facility component. This preferred recipient site is located approximately 2.3 miles north of the Project, is similar to habitats found on the Project site, and has the potential to support all life stages of the desert tortoise. Sunlight Recipient Site is approximately 9 miles north of I-10. Kaiser Road provides access to

the site for translocation and for any follow-up monitoring in the site. There are designated road and utility ROWs located within the Sunlight Recipient Site that surround unpaved roads, but they are narrow and infrequently traveled.

To estimate desert tortoise abundance at this site for the purposes of this biological opinion, we used protocol survey results from Desert Sunlight's Desert Tortoise Translocation Plan. Data was collected between spring 2008 and spring 2009 (Ironwood Consulting and Woodward 2011). Desert tortoise field surveys at the Sunlight Recipient Site located 32 live tortoises. Tortoise population densities in the site were estimated at 8.8 tortoises per mile² (Ironwood and Woodward 2011). The site does not show evidence of desert tortoise population depletion (e.g., numerous carcasses). The estimated average density is 13.8 tortoises per mile² for the Colorado Desert Recovery Unit, and Service guidance considers areas "depleted" only if tortoise densities are less than 7.3 tortoises mile² (Service 2011c).

Using our method for estimating tortoise numbers (Service 2010b), we estimate that 49 subadult and adult tortoises are within the Desert Sunlight Recipient Site. To estimate the number of juveniles and eggs on site, we used the method described above and calculated that between 9 and 40 juveniles and reproductive females may produce approximately 215 eggs per year.

If the primary recipient or secondary site may not be used for translocation purposes due to density thresholds or disease prevalence, the applicant would identify another recipient site or propose expansion of the primary site and contact the Service, BLM, and CDFW for approval of the new or expanded recipient site prior to its use. If the identification and analysis of an alternative or expanded recipient site becomes necessary, BLM would contact the Service prior to implementation of any translocation activities to determine the need to reinitiate consultation.

Status of Desert Tortoise Critical Habitat within the Action Area

In the action area, I-10 approximately parallels the northern boundary of the Chuckwalla CHU, and presents a semi-permeable barrier to movement between this CHU to the south and Joshua Tree National Park and the Pinto Mountain CHU to the north. Part of the Chuckwalla CHU lies west of Kaiser Road and directly west of the gen-tie transmission line extending north of I-10 near Desert Center and Red Bluff Substation. Desert tortoise critical habitat includes the following six PCEs (Service 1994b):

1. Sufficient space to support viable populations within each of the six recovery units to provide for movement, dispersal, and gene flow.
2. Sufficient quantity and quality of forage species and the proper soil conditions to provide for the growth of such species.
3. Suitable substrates for burrowing, nesting, and overwintering.
4. Burrows, caliche caves, and other shelter sites.

5. Sufficient vegetation for shelter from temperature extremes and predators.
6. Habitat protected from disturbance and human-caused mortality.

These PCEs operate together in supporting occupancy of suitable habitat by tortoises, and associated dispersal and gene flow, the primary role and function of critical habitat on the Project site from a regional perspective.

Desert tortoise critical habitat lies to the west of the proposed solar facility but would be affected (crossed) by portions of the proposed gen-tie route south of the solar facility along I-10. The effects of a proposed gen-tie in this location have been analyzed in the Desert Sunlight biological opinion (Service 2011a). The gen-tie for this project will be co-located within the same ROW using the same transmission towers, permanent access, and temporary roads. As noted in the “Environmental Baseline” section of the document, in the Desert Sunlight biological opinion, the Service determined that direct loss of the approximately 34 acres of designated critical habitat for desert tortoise was determined negligible relative to the 1,020,600 acres of critical habitat designated within the Chuckwalla CHU (Service 2011a).

Land Acquisition

Land acquisition is proposed to offset the permanent loss of desert tortoise habitat. The applicant will protect in perpetuity conservation lands in the ratios and for the acreages identified in the “Conservation Measures” section (see Compensation for Desert Tortoise Habitat Loss (MM-VEG-6)). While the location of these lands has not yet been determined, lands selected for acquisition would be within the desert tortoise habitat connectivity corridor within the Colorado Desert Recovery Unit (Service 2011b) for the primary purpose of securing a desert tortoise habitat linkage along the I-10 corridor. Acquisition would occur along this corridor in the Chuckwalla CHU and DWMA between Cactus City and Desert Center, where existing crossings connect contiguous desert tortoise habitats to the north and south of the freeway, and ultimately with Pinto Wash linkage northwest of the Project.

By conducting a desktop analysis evaluating landownership in conjunction with desert tortoise habitat models, the Service has determined that there is an adequate amount of privately owned land with desert tortoise habitat available for acquisition. Non-profit conservation groups and for-profit mitigation banking organizations are actively identifying and acquiring lands targeted for offsetting impacts to desert tortoise habitats associated with renewable energy projects in this region. The Service has coordinated with BLM, CDFW, a private mitigation company, and the applicant about the feasibility of acquiring private land within the I-10 corridor. At the time of our discussion, we mutually agreed that acquisition is feasible within the Desert Tortoise Connectivity Corridor. We recognize as the demand for acquisition of compensation lands increases, the price per acre also may increase, but this does not affect availability. The abundance of desert tortoise populations within potential acquisition lands is unknown since the specific areas have not yet been identified. However, because acquisition would focus on

areas connected to lands with desert tortoise habitat of equal or higher quality/role and function as the Project, we anticipate that the acquisition lands would contain suitable habitat that is currently occupied, likely to be occupied in the future, and enhance the connectivity role and function of adjoining habitat. Acquired lands would be managed for desert tortoise habitat value and contribution to recovery.

EFFECTS OF THE ACTION

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat that would be added to the environmental baseline, along with the effects of other activities that are interrelated or interdependent with that action. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification, and interdependent actions are those that have no independent utility apart from the action under consideration (50 CFR § 402.02).

In the “Environmental Baseline” section, we derived estimates of the numbers of subadult, adult, and juvenile desert tortoises and eggs that are likely to occur within the action area from pre-project survey data, published literature, long-term monitoring reports prepared by the Service and previous biological opinions. These sources constitute the best available information and we have used the estimates for the following analyses. We acknowledge that not all individuals killed or injured during construction, operations, and maintenance activities will be detected by biological monitors or project staff and subsequently reported to us. The inability to detect all killed or injured individuals is largely due to the desert tortoise’s cryptic nature, fossorial habits, and limited abundance; and in the case of juveniles and eggs, their small size and location underground reduce detection probabilities of these life stages. Lastly, scavengers may find the carcasses before monitors and either remove them from the site or dismember them to the extent that the cause of death cannot be determined.

Direct Effects

Direct effects associated with the construction and O&M of the Project may result in death or injury to desert tortoises. Direct effects associated with the project include (1) direct mortality from project equipment and construction activities; (2) direct mortality due to increased traffic and road access; (3) translocation of tortoises from the Project; and (4) loss of habitat used to support life history requirements.

Construction and O&M

Death and injury of desert tortoises could result from collisions with or crushing by vehicles or heavy equipment, including individuals that take shelter under parked vehicles and are killed or injured when vehicles are moved. Desert tortoises could also be injured or killed during excavation activities such as clearing and grubbing of vegetation; trenching activities and entrapment in open trenches and pipes. Individual tortoises or their eggs could be crushed or buried in burrows during construction and O&M-related activities. Because of increased human

presence in the area, desert tortoises may be killed or injured due to collection or vandalism associated with increased encounters with workers, visitors, and unauthorized pets. Desert tortoises may also be attracted to the construction area by application of water to control dust, placing them at higher risk of death or injury.

To minimize incidental death and injury of desert tortoises residing in or entering the construction or O&M disturbance areas (e.g., project site, linear facilities, access roads), the applicant would implement the general and species-specific actions specified in the “Conservation Measures” section as part of the proposed action. This section outlines specific measures and their component parts that are summarized below with representative examples of how the applicant would minimize adverse effects to the desert tortoise. Tortoise take tortoises would be minimized by employing the Authorized Biologist and Biological Monitor(s) (MM-VEG-1). These biologists would be present during all ground-disturbing construction activities that have the potential to disturb soil, vegetation, and wildlife (MM-VEG-4). The Authorized Biologist will have authority to halt all activities in any area where there would be an unauthorized adverse impact. The Authorized Biologist must meet the Service’s Authorized Biologist qualifications and be approved by the Service, BLM, and CDFW prior to the initiation of ground-disturbing construction activities.

Prior to construction, the Project site would be permanently fenced in phases with desert tortoise exclusion fencing. Each phase would be cleared of all tortoises prior to any ground disturbance. During construction of the permanent and temporary exclusion fencing, any desert tortoises located during the surveys would be either moved out of harm’s way or translocated to the recipient site as outlined in the Service-approved translocation plan (MM-WIL-2). Death or injury would be further minimized by delineating the limits of construction with flagging or orange fencing and confining all disturbances, vehicles, and equipment to fenced/flagged areas as verified by the Authorized Biologist or Biological Monitor(s) (MM-VEG-4).

Any desert tortoises undetected during the initial clearance surveys may be located during construction activities by routine site inspections by the Authorized Biologist or incidental observations by construction workers. The WEAP would be administered to all onsite personnel and be repeated annually for all permanent personnel and within a week of arrival to any new construction personnel (MM-VEG-3). This training would enhance the effectiveness of onsite personnel to improve detection and avoidance of desert tortoises, and ensure proper translocation procedures are adhered to during construction and O&M activities.

Additional actions to avoid and minimize incidental death and injury of desert tortoises include confining all parking and staging areas within the desert tortoise exclusion fence as feasible, covering or backfilling trenches to prevent entrapment, storing construction materials and piping inside the perimeter security fence, and minimizing the amount of water used for dust abatement to avoid ponding, which acts as an attractant to desert tortoises and their predators (MM-WIL-1). We expect that death and injury of most subadult and adult tortoises largely would be avoided during construction and O&M activities through compliance with the conservation measures.

We anticipate that an unknown number of eggs would be taken, based on the difficulty of detecting juveniles and tortoise eggs. Based on the calculations performed for the “Environmental Baseline” section, we estimate that as many as two juvenile desert tortoises may occur within the Project site. We also estimate at least one reproductive female on the Project site and an unquantifiable number of eggs. No estimates were calculated for the gen-tie. Because the estimate for the number of eggs is for total annual production, we cannot predict what portion of this total would be present on site during construction activities for any given phase, and therefore, cannot estimate how many eggs would be destroyed by construction and O&M activities. We do not expect loss of eggs or juveniles in the project footprint would affect the species’ local population level because the number of juveniles and eggs that may be taken is extremely small and the early life stages naturally suffer higher mortality rates and are not as important to the long-term conservation of the species as are breeding adults.

Mortality from Vehicles & Effects of Accessing Work Sites

Primary access during construction to the Project site would be via Kaiser Road. The offsite O&M facility will use State Route 177 (SR 177) and established roads that would not require additional road improvements. No additional access roads would be constructed outside of the perimeter security fence and permanent desert tortoise exclusion fencing.

A suite of conservation measures will reduce the effects of accessing the work area and traffic mortality. This includes marking all construction areas, including new and existing roads and all areas outside the Project (MM-VEG-4), and enclosing the solar facility with tortoise exclusion fencing (MM-WIL-2). All vehicles would be confined to flagged areas and workers would be required to check under vehicles for tortoises prior to moving the vehicle (MM-WIL-1). All project personnel will be required to participate in the WEAP (MM-VEG-3) and speed limits will be limited to 15 miles per hour or less while on paved roads in the solar facility, maintenance roads for linear facilities, or unpaved access roads where desert tortoise clearance surveys and translocations have not been completed (MM-WIL-1), resulting in workers being less likely to strike desert tortoises.

Access to project work areas outside of the fenced facilities (e.g., gen-tie line or roads) may kill or injure desert tortoises due to elevated use of existing routes. Estimated traffic levels during construction from this project are within the threshold expected to depress tortoise numbers. Studies demonstrated that impact on the abundance of desert tortoise sign can be detected adjacent to roads and highways with traffic levels from 220 to over 5,000 vehicles per day (Hoff and Marlow 2002). Given the connectivity importance of the area in the immediate vicinity of Kaiser Road, and the cumulative impacts from Desert Sunlight and the proposed Eagle Mountain Pumped Storage Hydroelectric Project, any increase in road-induced mortality over baseline levels is a potential concern. Increased mortality in this narrow linkage would be expected to further decrease tortoise population abundances and densities, thereby reducing functionality of this linkage. However recent surveys indicate that most of the active burrows and live animals are outside the road-effect zone, north of the project and west of Kaiser Road (Figure 5). In an effort to reduce construction related mortality outside fenced areas and on Kaiser Road, the

applicant proposes to provide information on desert tortoise identification and distribution within the action area to all onsite personnel including subcontractors and delivery personnel (MM-VEG-3). Because we also expect that high traffic levels associated with construction will be variable in intensity (during peak traffic hours 6 a.m. to 9 a.m. and 4 p.m. to 6 p.m.) throughout the construction period (24 months), traffic will not reduce the functionality of this linkage. As noted in the traffic analysis, traffic is expected decrease substantially during O&M (BLM 2012).

Desert Tortoise Translocation

Capture and translocation of desert tortoises may result in accidental death and injury from stress or disease transmission associated with handling tortoises, stress associated with moving individuals outside of their established home range, stress associated with artificially increasing the density of tortoises in an area and thereby increasing competition for resources, and disease transmission between and among translocated and resident desert tortoises. Capture and handling of translocated and resident desert tortoises for the purposes of attaching transmitters, conducting health assessments, which include visual inspection relative to body condition, clinical signs of disease, and collection of biological samples for enzyme-linked immunosorbent assay (ELISA), also may result in accidental death or injury.

Capturing, handling, and moving tortoises for the purposes of translocating them out of the Project or out of harm's way may result in accidental death or injury if these methods are performed improperly, such as during extreme temperatures, or if individuals void their bladders and are not rehydrated. Averill-Murray (2002) determined desert tortoises that voided their bladders during handling had lower overall survival rates (0.81 to 0.88) than those that did not void (0.96). If multiple desert tortoises are handled by biologists without the use of appropriate protective measures and procedures, such as reused latex gloves, pathogens may be spread among individuals. To address these potential effects, the translocation plan has been drafted in accordance with the most recent Service guidance (Service 2010a). The implementation would continue to be adaptively managed over time to facilitate a successful translocation effort. Because the applicant would adhere to the most recent Service guidance in addition to implementing the conservation measures outlined in the proposed action, we anticipate any mortality or injury to desert tortoises from activities associated with removing individuals from the Project site is unlikely.

We anticipate that the applicant will capture and move all subadult and adult desert tortoises from the fenced solar facility and, if necessary, will capture and move subadult and adult desert tortoises from any other portion of the action area where individuals may be in harm's way of project activities. Desert tortoises located on the Project site found greater than 1,640 feet from the perimeter fence will be moved to an approved recipient site outside of their existing home ranges. If juveniles or eggs are located, they will be handled as described in the Desert Tortoise Translocation Plan. Because the project would be built in phases, during which time desert tortoise abundance within the area will likely change, we cannot predict exactly how many individuals will be removed from the Project site and other related work areas. Based on the

survey results for the Project site, we estimate that up to three subadult or adult desert tortoises may be translocated to the Sunlight Recipient Site, and that the Project site may support two juvenile desert tortoises and reproductive female may produce an unquantifiable number of eggs.

Following the Service's translocation guidance (Service 2010a), health assessments would be conducted on all tortoises prior to being translocated. For tortoises found within 1,640 feet of the perimeter fence or project boundary, visual health assessments (without blood draw for ELISA testing) would be conducted. For tortoises that would be moved greater than 1,640 feet to the Sunlight Recipient Site, visual health assessments and blood draw for ELISA testing would be conducted.

While we cannot reasonably predict if an increase in disease prevalence within the resident population may occur due to translocation of three individuals, our analysis considers the following mitigating circumstances that are likely to reduce the magnitude of this risk:

1. The applicant would use experienced biologists and approved handling techniques that are unlikely to result in substantially elevated stress levels in translocated animals.
2. Density-dependent stresses are unlikely to occur for reasons stated below.
3. Any animal that has clinical signs of disease or ELISA-positive blood test would not be translocated.

Because ELISA testing can result in false-positive results (i.e., an animal may test positive even though it is not a carrier of the disease), healthy individuals may be removed from the translocated population due to concern over disease. These individuals would not be released into the wild and would no longer contribute to the environmental baseline for the action area. Because the applicant would coordinate with the Service and perform follow-up testing of ELISA-positive individuals, the potential for removing false-positive individuals from the translocated population is low. Thus, few, if any, desert tortoises would be incorrectly removed from the population due to false-positive results. Similarly, some of the animals that test positive may have survived past disease infections and are healthy. Though our understanding of disease ecology is not complete and removal of these individuals from the wild population could eliminate individuals with superior fitness and genetic adaptations for surviving disease from the gene pool, the low numbers of tortoises involved likely would not be large enough to affect population genetics in the wild.

Apart from disease, translocation may also affect resident desert tortoises within the recipient site due to local increases in population densities. Desert tortoises from the project site would be moved to areas now supporting a resident population that may result in increased inter-specific encounters, and thereby, an increased potential for spread of disease, potentially reducing the health of the overall population; increased competition for shelter sites and other limited resources; increased competition for forage, especially during drought years; or increased

incidence of aggressive interactions between individuals (Saethre et al. 2003). To minimize potential density-dependent effects, recipient sites must be sufficiently large to accommodate and maintain the resident and translocated desert tortoises (Service 2010a).

Based on our estimate of the resident population at the recipient sites as discussed in the “Environmental Baseline” section, we calculated the maximum allowable final density⁴ and abundance (i.e., residents plus translocatees) at the recipient sites. For the Sunlight Recipient Site, density and abundance of desert tortoises after translocation should not exceed 19.27 tortoises per mile² or 119⁵ individuals. Therefore, the translocation of up to 3 subadult or adult tortoises from the solar facility site, combined with the estimated 49 resident desert tortoises, does not exceed the maximum threshold for this site. We acknowledge that Desert Sunlight is using this location as a translocation site and has translocated four individuals and may translocate three more individuals pending disease results. However, adding a total of 10 individuals from both projects will not exceed the maximum threshold for this site.

Should the density of resident desert tortoises at the recipient sites be higher than estimated, the size of the recipient sites may need to be expanded to ensure the final density, following translocation, stays within the allowable threshold. By virtue of its size, the Sunlight Recipient Site is likely to support all of the desert tortoises to be translocated. We anticipate that density-dependent effects on resident desert tortoise populations are likely to be minor for the following reasons:

1. Health assessments will be performed on all desert tortoises prior to translocation thus decreasing the potential for introduction of infectious diseases to the recipient site.
2. A threshold density has been calculated for the recipient sites using the recommended maximum mean density for the recovery unit⁴. This threshold is significantly lower than that which adverse effects were observed in previous post-translocation studies (Saethre et al. 2003).
3. Translocation will be implemented such that individuals are distributed throughout the site.
4. The recipient sites are contiguous with suitable desert tortoise habitats, which will facilitate dispersal into other areas.

The proposed translocation plan and the best available information regarding density estimates and thresholds and methods for determining disease prevalence indicate that all of the desert

⁴ Projected density after translocation at the recipient sites (residents plus translocated adult individuals (at least 180 millimeters carapace length) should not exceed the 68 percent confidence interval of the mean density (this is an asymmetrical interval based on one standard deviation to each side of the mean) in the respective desert tortoise recovery unit. Mean density in the Colorado Recovery Unit is estimated to be 13.8 tortoises per mile² (Service 2011c); therefore, maximum allowable density equals 19.27 tortoises per mile².

⁵ Calculated as the square miles of the recipient site (6.2 mile²) multiplied by 19.27 tortoises per mile²

tortoises expected to be translocated from the Project can be accommodated at each of the recipient sites. However, if disease prevalence or density thresholds prevent the use of all selected recipient sites, the applicant will need to identify alternative suitable areas for translocation. Such alternative translocation areas would constitute a change in the Project description that likely would necessitate a reinitiation of consultation.

Following release, desert tortoises are expected to disperse, but we cannot predict the movement patterns of all translocated individuals. Dispersal distances following translocation appear to be influenced by the distance they are moved from their home range and the availability of resources in the area to which they are moved. Desert tortoises' translocated relatively short distances from their home ranges tend to move shorter distances from their release points than desert tortoises translocated more than 1,640 feet. Nussear (2004) reported that for adult desert tortoises translocated greater than 1,640 feet, the mean straight-line dispersal distance for both males and females ranged from 0.6 to 3.7 miles. Walde et al. (2008) reported that the mean straight-line dispersal distances for adult desert tortoises using two experimental treatments was approximately 1.6 miles and 2.6 miles for males and 0.9 mile and 1.4 miles for females. Maximum straight-line dispersal distances for translocated adult males ranged from 3.9 miles (Field et al. 2007) to 7.8 miles in the first year following translocation (Walde et al. 2008). The degree to which translocated desert tortoises expand the area they use depends on whether tortoises are released into typical or atypical habitat; that is, if the recipient area supports habitat that is similar to that of the source area, desert tortoises are likely to move less (Nussear 2004). Translocated desert tortoises appear to reduce movement distances following their first post-translocation hibernation to a level that is not significantly different from resident populations (Field et al. 2007; Nussear 2004). As time increases from the date of translocation, most desert tortoises alter their movement patterns from dispersed, random patterns to more constrained patterns, which may indicate establishment of a new home range (Nussear 2004).

Just as we cannot predict the distances translocated desert tortoises will move, we also cannot predict the direction these individuals are likely to move. Berry (1986) observed that translocated desert tortoises have exhibited a tendency to orient toward the location of their capture and attempt to move in that direction, but other research showed no discernible homing tendency in translocation individuals (Field et al. 2007). Data specific to short-distance translocations indicate that at least some individuals will attempt to return to their former home ranges after release (Stitt et al. 2003, Rakestraw 1997).

Based on previous translocation studies, straight-line dispersal distances from release points generally vary during the first year following translocation. While the mean straight-line distances reported for several studies are close to or less than 1.6 miles, some translocated desert tortoises move much farther (Drake et al. 2009, Field et al. 2007, Nussear 2004). Based on our analysis of the available data, we expect the movements of most tortoises translocated more than 1,640 feet to remain within 4 miles of their release points. This distance was derived by examining the upper limits of the 95 percent confidence intervals for available data. To reiterate however, translocated individuals can also significantly expand the area they occupy in the first

year following translocation (e.g., 3.9 to 6.9 per mile² at a Nevada site, 0.2 to 10.3 per mile² at a Utah site). Based on movement of tortoises after translocation, the Service (2011c) recommends that a proposed translocation site is at least 6 miles from major unfenced roads or highways.

In one study, the majority of dispersal movement away from the release site occurred during the first 2 weeks after translocation (Field et al. 2007). During this time and over the period prior to establishment of a new home range, translocated desert tortoises may experience higher potential for mortality because they are moving through unfamiliar habitats and are less likely to have established cover sites that provide protection. Studies have documented various sources of mortality for translocated individuals, including predation, exposure, fire, disease, and flooding (Berry 1986; Nussear 2004; Field et al. 2007; U.S. Army 2009, 2010). Of these, predation appeared to be the primary mortality mechanism in most translocation studies (Nussear 2004; Field et al. 2007; U.S. Army 2009, 2010).

Various studies have documented mortality rates of translocated desert tortoises ranging from 0 to 21.4 percent (Nussear 2004, Field et al. 2007). Nussear (2004) found that mortality rates among translocated desert tortoises were not statistically different from that observed in resident populations. However, because this study did not compare mortality rates in resident populations to those in control groups, we cannot determine if the translocation caused increased mortality rates in the resident population. Preliminary results from recent studies in support of the Fort Irwin expansion (U.S. Army 2009, 2010) comparing mortality rates associated with resident and translocated desert tortoise populations with that of control populations indicated translocation did not increase mortality above natural levels (Esque et al. 2010). This and other fieldwork indicate that desert tortoise mortality is most likely to occur during the first year after release. After the first year, translocated individuals are likely to establish new home ranges and mortality is likely to decrease.

Juvenile desert tortoises will comprise a portion of the overall mortality predicted within resident and translocated populations. In general, this life stage experiences higher mortality rates than subadult and adults under natural circumstances and are more susceptible to predation. We estimate up to two juveniles may occur on the Project site and that the applicant will move one or two of these individuals. Therefore, we do not anticipate a large amount of juvenile mortality associated with translocation. Because of the difficulty in locating juvenile desert tortoises, individuals that are not translocated are likely to die during construction. However, as stated above for direct effects from construction and O&M, based on the estimated desert tortoises expected to occur within the action area and the conservation measures that have been identified for each Project component, we conclude that death and injury resulting from translocation of juvenile desert tortoises or other construction and O & M activities will not appreciably reduce the desert tortoise population or reproductive success within the Colorado Desert Recovery Unit.

Based on the available data on translocation and consistent with the findings in Esque et al. (2010), we conclude that mortality rates in the resident and translocated populations are unlikely to be elevated above levels that these populations would experience in the absence of

translocation. Therefore, we anticipate that death or injury of few, if any; subadults, adults, juveniles, or eggs will be the direct result of translocation.

Desert tortoises are likely to be moved out of harm's way during the stringing of the gen-tie line as detailed in the analysis in the Desert Sunlight biological opinion and estimates from pre-project survey data (Service 2011a). Because disturbance areas for this Project component are relatively small, moving desert tortoises immediately outside of the work area is not likely to displace them from their existing home ranges. Consequently, any desert tortoises moved from the gen-tie line will continue to occupy familiar territory and use known shelter sites and are unlikely to suffer post-translocation mortality associated with temporary removal from the disturbance areas. Furthermore, subsequent to completion of the gen-tie construction, desert tortoises will be able to return to these areas.

In conclusion, we do not anticipate that moving desert tortoises out of harm's way from construction of linear features would result in death or injury because these individuals would remain near or within their existing home range, which is not likely to result in significant social or competitive impacts to resident desert tortoises in the area. For tortoises translocated outside of their home range to the recipient site, increased risks may lead to mortality during the period tortoises are attempting to establish new home range, typically during the first year after release. Such risks include exposure, stress, dehydration, inadequate food resources, and increased predation. In addition, we anticipate that a small number of resident desert tortoises at the recipient site may die from natural causes due to these same vulnerabilities. However, we cannot determine if mortality rates in the translocated or resident populations would be above natural mortality levels for the recipient site. In addition, the potential impacts of capturing, handling, and moving tortoises for the purposes of translocation would be avoided or reduced through implementation of the actions specified in the "Conservation Measures" section. Lastly, as described in the draft translocation plan, prior to moving any tortoises a disposition plan will be prepared that addresses, visual health assessment and URTD test results, monitoring radio transmitted desert tortoises, findings reported to the Service, and adaptive management strategies implemented, as needed (Aspen Environmental Group 2012d).

Effects of Loss of Habitat

Phased construction of the proposed solar facility and ancillary facilities would cause the long-term loss of 1,300 acres of desert tortoise habitat. Based on numerous studies cataloguing restoration rates of desert vegetation, we consider all ground-disturbing impacts associated with the Project to be permanent. Vasek et al. (1975) found that in the Mojave Desert transmission line construction and O&M activities resulted in a permanently de-vegetated maintenance road, enhanced vegetation along the road edge and between tower sites (often dominated by nonnative species), and reduced vegetation cover under the towers, which recovered significantly but not completely in about 33 years. Webb (2002) determined that absent active restoration following extensive disturbance and compaction in the Mojave Desert, soils in this environment could take between 92 and 124 years to recover. Other studies have shown that recovery of plant cover and

biomass in the Mojave Desert could require 50 to 300 years in the absence of restoration efforts (Lovich and Bainbridge 1999).

Although the estimated percentage of habitat expected to be lost due to construction and O&M of the Project does not constitute a significant portion of the recovery unit, the location of the Project site within an important habitat and population linkage between the Chuckwalla CHU and DWMA and populations in the northern portion of the species' range may affect long-term genetic connectivity in this region. The effects to habitat and population connectivity are discussed below.

Decommissioning

Decommissioning will include actions to remediate impacts, such as decompacting soils, seeding, and nonnative species control. But these areas would be permanently lost or ecologically unsuitable for decades to come. Abella (2010) conducted a quantitative review of over 46 studies evaluating post-disturbance plant recovery and success in the Mojave and Sonoran deserts and found that the reestablishment of perennial shrub cover (to amounts found on undisturbed areas) generally occurs within 100 years but in fewer than 40 years in some situations. He also found that a number of variables likely affect vegetation recovery times, including but not limited to, climate (e.g., precipitation, temperatures), invasion by nonnative plant species, and magnitude and extent of ongoing disturbance. Therefore, when and if successful restoration of these areas would render the habitat suitable for desert tortoises in the future cannot be determined at this time and potential effects of decommissioning would be deferred until closure of the Project is foreseeable. For the purposes of this biological opinion we are assuming the permanent loss of suitable habitat for the entire Project site.

Indirect Effects

Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur (50 CFR § 402.02). Indirect effects may occur outside the area directly affected by the action (Service 1998). Indirect effects associated with the Project construction and O&M may also result in death or injury to desert tortoises. Potential indirect effects associated with the Project include (1) degradation of habitat by the spread of nonnative plant species; (2) predation by common ravens and increase of raven subsidies; (3) loss or fragmentation of habitat linkages important to maintaining population and genetic connectivity; and (4) edge effects including noise and lighting from construction and operations.

Introduction of Nonnative Plant Species

Development of the Project may introduce and spread of nonnative, potentially invasive plant species into habitats adjacent to the Project site. Nonnative plant species now occur on the Project site at various densities and within the action area, and numerous existing features act as vectors that facilitate infestations (e.g., roads, routes, transmission lines, railroad, and Colorado River aqueduct). However, construction and O&M activities of the Project components may

increase distribution and abundance of nonnative species within the action area due to ground-disturbing activities that favor these species. Project equipment may transport nonnative propagules into the area where nonnative plants may become established and proliferate.

Introduction of nonnative species can affect the quality and quantity of plant food available for desert tortoises, thus affecting the nutritional intake (Service 2011b). Nonnative plant species may lead to increased wildfire risk, which ultimately may result in future habitat losses (Brooks 2003) and negatively affect the desert tortoise by altering the habitat structure and species composition of their food plants (Brooks and Esque 2002).

Incorporated in the proposed action are numerous conservation measures to address the potential effects from nonnative plant species. The *Integrated Weed Management Plan Project* (MM-VEG-9) (Aspen Environmental Group 2012d) includes pre-project assessment of nonnative plants, monitoring and treatment. Although we cannot reasonably predict the increase in nonnative species abundance that this Project may cause within the action area, we expect any increase to be minimal because measures outlined in the plan minimize the habitat degradation by controlling the spread of nonnative plants. Moreover, the applicant's use of herbicides would be limited to areas within the perimeter security fence and in accordance with the BLM's *Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States* (BLM 2007) and the *National Invasive Species Management Plan* (NISC 2008), so weed control would have minimal, if any, effects to native shrubs and annual plants utilized by tortoise.

Predator Subsidies

Common ravens are attracted to human activities in the desert because food and water subsidies, and roosting and nesting substrates that would otherwise be unavailable are introduced or augmented by human encroachment. Human activities also facilitate expansion of raven populations into areas where they were previously absent or in low abundance. Ravens likely will frequent the Project because of the potential availability of such subsidies, which likely are now found in and around Lake Tamarisk, Desert Center, and other nearby rural and urban areas. Road-kill of wildlife along I-10 and other roads provides additional attractants and subsidies for opportunistic predators and scavengers. Such road-kill is likely to increase during Project construction and O&M activities, further exacerbating the raven/ predator attractions and increasing the risk of predation on desert tortoises.

Facility infrastructure, like power poles, fences, buildings, and other structures on the Project site, may provide perching, roosting, and nesting opportunities for ravens and other avian predators. Natural predation rates may be altered or increased when natural habitats are disturbed or modified. As stated above, common raven populations in some areas of the Mojave Desert have increased 1,500 percent from 1968 to 1988 in response to expanding human use of the desert (Boarman 2002). Since ravens were scarce in the Mojave Desert prior to 1940, the existing level of raven predation on juvenile desert tortoises is considered an unnatural occurrence (BLM 1990). In addition to ravens, feral dogs have emerged as significant predators of desert tortoises adjacent to residential areas. Though feral dogs may range several miles into

the desert and have been found digging up and killing tortoises (Service 1994a, Evans 2001), we are not aware of any reports of feral dogs in the area.

Availability of predator subsidies from construction and O&M-related activities will be minimized by managing onsite refuse and available water. Worker awareness, and construction and post-project monitoring will be implemented in accordance with the *Common Raven Management Plan for the Desert Harvest Solar Project* (MM-WIL-2) (Aspen Environmental Group 2012c). Some of the provisions of the plan include proper disposal of all trash materials in self-closing containers, removal of road-kill from the Project and associated access roads immediately upon discovery, and minimizing the amount of water used for dust abatement to avoid standing water. In addition, the applicant will contribute funds to the regional common raven management program, which addresses indirect and cumulative impacts associated with projects that facilitate the expansion of raven populations into desert tortoise habitats. Funding implementation of this program is expected to enable the Service and other agencies to monitor and control raven populations at the regional scale. We expect the regional raven management program will reduce raven predation rates of juvenile and adult desert tortoises. The one-time contribution from EDF is estimated to be \$136,500 for the solar facility and gen-tie.

Edge Effects

Edge effects from solar development include increased noise levels, light pollution, impacts from roads, and increased dust. For our analysis, we assessed edge effects of the Project site and buffered area around the facility, even though these effects are poorly understood (Lovich and Ennen 2011). Increased noise levels and the presence of full-time facility lighting may affect desert tortoise behavior during construction and operations of the facility over a 30-year period. While limited data exist on the effects of noise on desert tortoises, Bowels et al. (1999 in Service 2011b) demonstrated that the species has relatively sensitive hearing (i.e., mean = 34 dB SPL), but few physiological effects were observed with short-term exposures to jet air craft noise and sonic booms. These results cannot be extrapolated to chronic exposures over the lifetime of an individual or a population. Because we also do not have sufficient data documenting the effects of artificial lighting on desert tortoise behavior, we cannot reasonably predict the magnitude of effect either noise or light will have on adjacent desert tortoise populations. Based on the ability of other species to adapt to noise disturbance, noise attenuation as distance from the Project increases, and desert tortoises do not rely on auditory cues for their survival, we do not expect tortoises to be injured or killed as a result of noise impacts. The applicant also has included measures as part of the proposed action to minimize noise and light-related impacts to the species within the action area (MM-VEG-4) (Aspen Environmental Group 2012a, BLM 2012).

Another type of edge effect affecting desert tortoise populations results from roads and highways (Bury et al. 1977, Nicholson 1978, Boarman and Sasaki 2006). Boarman and Sasaki (2006) found that desert tortoise populations are depressed next to major roadways out to a distance of at least 0.25 mile. Therefore, as discussed above, desert tortoise densities may be depressed in areas of suitable habitats within 0.25 mile on either side of portions of I-10, SR 177, and other

well-traveled roads in the Colorado Desert Recovery Unit. Dust and dust suppressants used during the construction of roads, facility construction, and infrastructure may also indirectly impact resident tortoises. Arid environments have the potential for natural dust emissions and construction activities increase dust emissions. Wind erosion can alter soil fertility and water-retention capabilities. Physiological and physical damage to plants could reduce primary productivity of forage species, thereby indirectly affecting wildlife food plants (Lovich and Ennen 2011). The proposed action includes measures to minimize dust within the action area; therefore, we do not expect desert tortoises to be adversely impacted by fugitive dust (MM-VEG-9) (Aspen Environmental Group 2012a, BLM 2012).

Because few data exist relative to edge effects from noise, light, vibration, and increased dust from construction and O&M activities, we cannot determine how these potential impacts may affect desert tortoise populations adjacent to the development sites. The lack of information is especially relevant when evaluating effects to individuals within the habitat linkage that would be impacted by the Project. While the magnitude and extent of these edge effects cannot be articulated at this time, the relatively low population numbers in the action area suggest few tortoises potentially would be affected.

Effects of Impacts to Habitat and Population Connectivity

As discussed above in the “Status of the Species” and “Environmental Baseline” sections, the Project ROW lies directly south of a naturally constricted linkage in the Upper Chuckwalla Valley and Upper Pinto Wash that connects the desert tortoise population in the Chuckwalla CHU and DWMA with populations in Joshua Tree National Park, Pinto Mountain CHU, Chemehuevi CHU and DWMA, and thence the Mojave Desert portion of the species’ range. This linkage is defined by topography, elevation, and geomorphology, with steep, rocky mountains limiting desert tortoise distribution to the west, and low elevations and sand dunes and playas limiting the distribution to the east. The linkage boundaries are based on the BLM’s NECO Plan landform data (i.e., dunes, playas, mountains, and hills), the 500-foot elevation contour, our knowledge of habitat conditions in the action area, and desert tortoise survey data from other lowland areas in the Colorado/Sonoran Desert with comparable habitat conditions (Service 2011a). This linkage corresponds well with the USGS desert tortoise habitat model (Nussear et al. 2009).

As discussed in the revised recovery plan (Service 2011b), habitat linkages are essential to maintaining rangewide genetic variation (Edwards et al. 2004, Segelbacher et al. 2010) and the ability to shift distribution in response to environmental stochasticity, like climate change (Ricketts 2000, Fischer and Lindenmayer 2007, EPA 2009). Natural and anthropomorphic constrictions can limit gene flow and the ability of desert tortoises to move between larger blocks of suitable habitat and populations. In the action area, existing anthropomorphic constrictions compound effects of natural barriers on desert tortoise population connectivity.

The Project site supports suitable habitats based on slope, vegetative composition and structure, substrate conditions, and the presence of a class 2 burrow. As a result, desert tortoises are likely to occur in low densities that may not be detected during the single point-in-time survey

conducted for the Project. Because individuals are known to move across extensive tracts of marginal habitats (Edwards et al. 2004; Averill-Murray and Averill-Murray 2005), we anticipate that low numbers of desert tortoises occasionally use the entire Project site in such a manner.

Using the USGS desert tortoise habitat model, we evaluated the potential for all linkages in this region. Based on our analyses, the Upper Chuckwalla Valley and Upper Pinto Wash, especially along the upper bajadas of the Eagle and Coxcomb mountains, represent the most viable remaining linkage in this region. Cottonwood Canyon and Big Wash may provide limited linkages through the Cottonwood and Eagle mountains, but both features are long, narrow washes that may not support resident tortoise populations. Though Penrod et al. (2012) suggested a linkage in Cottonwood Canyon, potential connectivity is compromised by a busy road that constrains the likelihood of desert tortoise occupancy and movement within this narrow canyon (M. Vamstad, Joshua Tree National Park, pers. comm. 2011; Service 2011b).

Because of its habitat requirements and life history traits, the desert tortoise is considered to be highly vulnerable to the effects of climate change (EPA 2009, National Wildlife Federation 2011). A future rise in temperature would increase environmental variability and desert tortoise mortality within the few putative linkages described above. The combination of increased environmental variability and decreased genetic variation in desert tortoise populations would lead to a higher likelihood of extirpation in linkage areas due to stochastic factors and human-related activities. Thus, landscape-scale redundancy in core habitat-linkage reserve design is an important principle in conservation strategies for widely distributed species like the desert tortoise (Service 1994a, 2008, 2011a). As summarized by Rayfield et al. (2011), the ability of organisms to move among habitat patches and populations is undermined by habitat fragmentation processes (Fischer and Lindenmayer 2007), and restricted movements have significant consequences to species' conservation (Damschen et al. 2006). Maintaining wildlife movement in the short-term allows for juvenile dispersal, recolonization of unoccupied habitat and population persistence, while in the long-term it enables range shifts in response to climate change and conserves genetic heterozygosity needed for evolutionary adaptation (Barrett and Schluter 2008). As a result, quantifying the degree to which landscapes promote or hinder a given species' occupancy and movement is essential to inform conservation decision-making (Calabrese and Fagan 2004).

Because redundancy in the linkage network between core populations in this portion of the species' range is limited, the Service contends that maintenance of connectivity along the I-10 corridor through Pinto Wash is imperative. However, the Project would eliminate 1,208 acres of habitat that now affords potential connectivity around the southern side of the Desert Sunlight project (Figure 6). Although the lands are modeled as low-value habitat under the USGS desert tortoise habitat model (Nussear et al. 2009), this area includes a series of washes and suitable substrates for burrowing, as evidenced by a desert tortoise class 2 burrow found on the eastern boundary and the abundance of coyote, kit fox, ground squirrel, and kangaroo rat burrows observed during a Service site visit. The proposed alignment of the eastern boundary of the Project would constrict any resident tortoises and movement opportunities to a variable 0.2- to 0.5-mile wide strip of residual habitat between the eastern edge of the Project and adjoining

degraded habitat and abandoned agricultural lands on adjacent private lands, also proposed for solar development. In Project scoping comments provided to BLM and in our comments on the DEIS, we recommended modifications of the proposed configuration of the eastern border of the Project site to align with that of the Desert Sunlight Solar Farm to provide a more robust corridor of native habitat connecting the MWD flood conveyance lands with Pinto Wash along the eastern edge of both projects. Though our recommended reconfiguration corridor is approximately half the width of the habitat linkage remaining northwest of the Desert Sunlight project and is located in lower habitat value lands, tortoises can use lower-quality intermountain habitat as dispersal routes (Averill-Murray and Averill-Murray 2005). Consequently, the 0.5-mile recommended corridor may support a greater functionality for desert tortoise and other wildlife than the residual habitat strip otherwise provided under the current proposal. But BLM's analysis of habitat connectivity in the area, summarized in the Desert Harvest DEIS, takes a different view, concluding on the basis of its own research that the Project realignment would not serve the purpose of improving connectivity, asserting that the critical wildlife connectivity area lies west of the Project and not east of the Project and that the Project site provides minimal support for regional connectivity. While we still believe that our Project redesign would reduce the Project's effect on regional connectivity for desert tortoise and other wildlife species, the BLM and applicant do not agree with our proposed reconfiguration based on the BLM's analysis.

Based on the above discussion and our biological opinion on the Desert Sunlight project, our assessment of the rangewide status of the species indicates that the loss of a large block of habitat on the Desert Sunlight Solar Farm reduced the options for tortoise connectivity within the action area of the Desert Harvest site, and this adverse effect is further compounded by the Project. As discussed in the Desert Sunlight biological opinion, conserving the smaller-scale, internal redundancy within remaining portions of the regional habitat linkage is essential to ensure that connectivity, albeit at a reduced level, is maintained. As such, the applicant has agreed to the same approach agreed to for the Desert Sunlight project, and shall acquire between 1,254 and 1,300 acres of private lands within the Desert Tortoise Connectivity Corridor (Service 2011a), including (1) habitat connections to as many culverts and bridges under I-10 as possible; and (2) minimizing the loss of desert tortoise habitat within the BLM/private landownership checkerboard that would preclude habitat connections to these crossings along this section of the I-10 or would fragment habitat, overlapping home ranges, and desert tortoise movement along the north and south sides of I-10 and the southern base of the Cottonwood and Eagle mountains. Protection from potential development in this area will consolidate conservation within the connectivity corridor to help ensure the continued occupation and movement of tortoises within this portion of the Chuckwalla DWMA and critical habitat unit, and connectivity with the remaining corridor along the western edge of the Chuckwalla Valley and upper alluvial habitats around the base of the Eagle Mountains west of the Project site (Figure 6).

Effects of Compensation

To offset the permanent loss of tortoise habitat, the applicant would provide habitat compensation at the ratios and for the acreages described in Compensation for Desert Tortoise

Habitat Loss (MM-VEG-6). While the precise location of these lands has not yet been determined, lands selected for acquisition will be within the Colorado Desert Recovery Unit (Service 2011b) and Chuckwalla CHU and DWMA. Acquisition priorities would be along the I-10 corridor between Cactus City and Desert Center, where existing crossings could be utilized to access contiguous desert tortoise habitats on either side of the freeway. The Service, BLM, and CDFW, as appropriate, will reach mutual agreement on the parcels selected for acquisition based on the criteria stipulated in the conservation measure to ensure the agencies' respective biological objectives for offsetting impacts to desert tortoise and other resources are achieved.

The abundance of desert tortoise populations within potential acquisition lands is unknown since the specific areas have not yet been identified. However, because acquisition will focus on areas connected to lands with desert tortoise habitat of equal or higher quality/role and function than the Project, and acquired lands would enjoy an improved level of management above existing levels, we anticipate that the acquisition lands will contain suitable habitat that is currently occupied or likely to be occupied in the future. Acquired lands will be managed for desert tortoise conservation.

Although the acquisition and protection of suitable desert tortoise habitat through these compensation requirements would not create new habitat within the recovery unit, it would ensure a no net loss of desert tortoise habitat managed for the conservation of the species within targeted conservation areas. Acquisition, management, and permanent protection of any newly acquired lands may facilitate a reduction in the number and magnitude of threats and mortality mechanisms in areas not currently protected within the Colorado Desert Recovery Unit.

Not-for-profit conservation groups and for-profit mitigation banking organizations are actively identifying and acquiring lands targeted for offsetting impacts to desert tortoise habitats associated with renewable energy projects in this region. Numerous land acquisitions and option agreements have been successfully executed to date and over twenty-five thousand acres of private lands occur within the I-10 corridor priority acquisition area. Using available data on landownership and willing sellers, the Service has determined that privately owned lands that support desert tortoise habitat are available for acquisition within the Desert Tortoise Connectivity Corridor. The applicant has met with both the Service and not-for-profit conservation groups to discuss land availability. We are also aware that the applicant and has met with a not-for-profit conservation group to develop a compensation strategy that has 1,300 acres within the Desert Tortoise Connectivity Corridor. But privately owned parcels may be deemed "unavailable" by the applicant for a number of reasons, including the following: (1) landowner(s) may not respond to inquiries or are otherwise inaccessible; (2) the land title is in dispute, under lien, held in trust and trustees cannot reach agreement on a sale, or otherwise encumbered by legal action; (3) constrained by easements and ROWs inconsistent with habitat conservation purposes; (4) an agreement on purchase price may not be reached; or (5) the land is not for sale regardless of price because of other pending land use actions. However, even if certain lands are deemed "unavailable" we are reasonably certain that the full acreage can be acquired within the Desert Tortoise Connectivity Corridor.

Effects on Critical Habitat

As discussed above in the “Status of Desert Tortoise Critical Habitat within the Action Area” section, permanent disturbance to PCEs of critical habitat that may result from the proposed action was previously addressed in the Desert Sunlight biological opinion (Service 2011a). EDF proposes to co-locate its gen-tie within the same transmission corridor, utilizing the same transmission structures, permanent access roads and temporary roads. The impacts associated with the gen-tie line were found to not likely appreciably diminish the value of the PCEs essential to the species’ recovery within the Chuckwalla CHU, and not likely result in substantial adverse effects to critical habitat throughout the species’ range. If the gen-tie lines cannot be strung concurrently, then temporary disturbance will be within the construction corridor and wire stringing activities will use previously cleared or graded sites (fan-shaped areas at each turn alignment for wire stringing). Conservation measures are also proposed to address temporary disturbance impacts associated with wire stringing (e.g., dust abatement). For these reasons, either way the Project would not permanently affect the PCEs beyond that previously analyzed.

Effects on Desert Tortoise Recovery

Per section 2(b), the primary purposes of the Act are to provide a means whereby the ecosystems upon which listed species depend may be conserved, and to provide a program for the recovery of listed species. Per section 2(c), Congress established a policy requiring all Federal agencies to use their authorities in seeking to recover listed species in furtherance of the purposes of the Act. Consistent with these purposes and Congressional policy, sections 3(5), 4(f), 7(a)(1) of the Act, and the implementing regulations (50 CFR § 402.02) to section 7(a)(2) of the Act, and related preamble (see 51 FR 19926), generally require Federal agencies to further the survival and recovery of listed species in the use of their authorities. Pursuant to these mandates, our analysis below assesses: (1) whether adverse effects from the Project to the environmental baseline of the desert tortoise are adequately offset; and (2) the extent to which the proposed action would cause “significant impairment of recovery efforts” or adversely affect the “species’ chances for survival to the point that recovery is not attainable” (51 FR 19934).

The applicant would implement conservation measures as part of the proposed action to avoid, minimize, and offset the adverse effects to desert tortoises in the Project. Overall, we expect few, if any, subadult and adult desert tortoises per year would be killed or injured during Project construction and O&M, and that a relatively small number of juvenile tortoises and eggs may be moved or destroyed during construction and O&M activities. We expect that most subadult and adult tortoises encountered during work activities would be either moved short distances out of harm’s way or translocated to specific recipient sites. Because the BLM and applicant would implement a variety of measures to reduce stress to these animals, we do not anticipate that death or injury would result from the handling and translocation of these individuals. Based on the results of translocation studies discussed above, most of the subadult and adult desert tortoises moved or translocated would continue to survive and reproduce at the sites to which they are moved (i.e., in adjacent habitats or the recipient sites). Consequently, we

anticipate that the proposed action would not appreciably diminish the reproductive capacity of the species, particularly in light of the relatively few desert tortoises that would be affected.

We do not anticipate that the loss of habitat from the Project would substantially reduce the ability of desert tortoises to meet recovery objectives and goals. This conclusion is based on the assumption that the majority of higher value habitat areas generally found within designated CHUs or other conserved lands in the 1994 Recovery Plan (Service 1994a), final rule for designation of critical habitat for the species (1994b), and revised recovery plan (Service 2011b), will be conserved. The proposed acquisition of between 1,254 and 1,300 acres of desert tortoise habitat would contribute to this base of conserved lands by adding to habitat linkages and population connectivity along the I-10 corridor within and between desert tortoise conservation areas, known populations of desert tortoises, and other lands allocated for conservation in the Colorado Desert Recovery Unit. In addition, impacts of the Project to designated critical habitat would be temporary during the stringing of the gen-tie transmission line previously analyzed in the Desert Sunlight biological opinion (Service 2011a). Therefore, as discussed in the “Effects on Critical Habitat” section above, the proposed action is not likely to appreciably diminish the value of the PCEs essential to the species’ recovery within the Chuckwalla CHU, or result in substantial adverse effects to critical habitat throughout the species’ range.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, local, Tribal, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. We are aware of several solar projects proposed on private lands within the vicinity of the action area, however these projects will likely cross Federal lands and require a BLM ROW grant for the generation intertie connect. We are not aware of any other future State, local, Tribal, or private actions reasonably certain to occur within the action area.

CONCLUSION

After reviewing the current status of the species, environmental baseline for the action area, effects of the proposed action, and cumulative effects, it is the Service's biological opinion that the proposed action is not likely to jeopardize the continued existence of the desert tortoise or destroy or adversely modify its designated critical habitat. We base this conclusion on the following:

1. The applicant would implement conservation measures as part of the proposed action to ensure that mortality and injury of desert tortoises are minimized (see “Conservation Measures” section). Measures include, but are not limited to employing Service-approved Authorized Biologist(s) and Biological Monitor(s) throughout Project construction, performing preconstruction clearance surveys, and installing permanent and temporary desert tortoise exclusion fencing.

2. The applicant would implement translocation in accordance with the most current Service guidance (Service 2010a) to ensure as many individuals are removed from the Project site as possible and to minimize mortality and injury risks associated with translocation.
3. The applicant would implement measures to reduce the potential for increased predation by common ravens, both in close proximity to the Project and regionally.
4. The applicant would implement measures to avoid, minimize, and control the introduction of and spread of nonnative plant species.
5. The best available data relative to densities of the Mojave population of the desert tortoise do not document a statistical population trend for this recovery unit. Hence, we do not have information to indicate that the loss of a relatively small number of individuals as a result of the proposed action would appreciably reduce our ability to achieve recovery objectives within the Colorado Desert Recovery Unit.
6. Translocation of some desert tortoises to an approved recipient site will increase desert tortoise numbers in those areas. Successful translocation would minimize some adverse effects of the proposed action by allowing those individuals to remain in the population and contribute towards recovery of the species.
7. Habitat compensation would result in an increase in the quantity and quality of habitat managed for the conservation of the desert tortoise.
8. Though the Project may affect population connectivity of the species by eliminating habitat that supports low densities of desert tortoises between the Chuckwalla CHU and DWMA and the northern portion of the species' range, this impact is not likely to appreciably reduce the reproduction, numbers, or distribution of the species to the extent that the survival and recovery of the species would be jeopardized, provided that the conservation measures to offset impacts specific to habitat and population connectivity are implemented.
9. The permanent loss of designated critical habitat for desert tortoise is negligible relative to the 1,020,600 acres of critical habitat designated within the Chuckwalla CHU, and this permanent loss and other temporary impacts resulting from the proposed action are not likely to appreciably diminish the value of the PCEs essential to the species' recovery within the Chuckwalla CHU, or result in substantial adverse effects to critical habitat throughout the species' range.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act, and Federal regulation pursuant to section 4(d) of the Act, prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat

modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined as intentional or negligent actions that create the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not the purpose of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below for desert tortoises are non-discretionary and must be undertaken by the BLM so that they become binding conditions of any ROW grant issued to the applicant, as appropriate, for the exemption in section 7(o)(2) to apply. The BLM has a continuing duty to regulate the activity covered by this incidental take statement. If the BLM: (1) fails to assume and implement the terms and conditions; or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable stipulations that are incorporated into the grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the BLM must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR § 402.14(i)(3)].

AMOUNT AND EXTENT OF TAKE

The proposed action will result in the take of all desert tortoises within the Project boundary, along the gen-tie and associated access roads, in areas where exclusion fencing would be installed, and within recipient sites resulting from Project construction and long-term O&M, including moving individuals out of harm's way and from translocation and subsequent health assessments. We anticipate that the number of desert tortoises that may be taken would be low due to the small number of individuals estimated to occur within the Project footprint and the anticipated effectiveness of conservation measures described as part of the proposed action. However, we cannot precisely quantify the amount of take that will occur during these activities. Some of the constraints that make it difficult to determine desert tortoise densities and abundance include the cryptic nature of the species (i.e., individuals spend much of their lives underground or concealed under shrubs), inactivity in years of low rainfall, and low abundance across a broad distribution within several different habitat types. In addition, tortoise numbers and distribution fluctuate in response to weather patterns and other biotic and abiotic factors over time. Hence, the numbers and distribution of desert tortoises within the area likely may have changed since project-specific surveys were completed. The number of juvenile desert tortoises and eggs is even more difficult to quantify because of small size, their location underground, and low detection probabilities during surveys. The following paragraphs define the form of take and number of individuals we anticipate resulting from the proposed action will take.

The disturbance of 1,300 acres of habitat from construction of the proposed solar facility, gente, and associated access roads and O&M-related activities may result in accidental death or injury of subadults, adults, and juvenile desert tortoises and eggs from crushing, trampling, or burial. If the project-related activities result in impacts to desert tortoise habitat beyond this acreage, the amount or extent of take will be exceeded.

As discussed in the “Environmental Baseline” section, we estimate that up to three subadult or adult desert tortoises, up to two juveniles, and an unquantifiable number eggs may occur within the proposed solar facility. The applicant will implement numerous conservation measures to avoid and minimize death and injury to desert tortoises, such as permanent or temporary desert tortoise exclusion fencing around construction zones and moving individuals out of harm’s way or translocating them appropriately. Based on the lack of live individuals and limited sign found during pre-project surveys (implying a small population in the project footprint) and because most tortoises will be found and translocated during preconstruction clearance surveys, we anticipate that most subadult and adult tortoises on site will be translocated or excluded from the solar facility and construction zones. Consequently, we anticipate that Project construction will result in the death or injury of a maximum of one adult or subadult tortoise. If more than one tortoise per year is found injured or dead during construction activities the take threshold will be exceeded. Because we estimate below that few, if any, subadult or adult desert tortoises would be killed, the terms and conditions below set additional thresholds for reinitiation of consultation related to take, in the form of death or injury, of desert tortoises in that size class.

For the anticipated take, in the form of mortality or injury, of juvenile desert tortoises and eggs resulting from Project construction (identified below), we would consider the amount or extent of that taking to be exceeded if the number of subadult and adult desert tortoises captured or collected on the Project site and perimeter fence lines exceeds three individuals. We have established this threshold because the BLM will not be able to accurately monitor the actual incidences of death and injury resulting from the construction of the Project (i.e., up to two juveniles and an unquantifiable number of eggs on the Project site) due to the likelihood that virtually all of the individuals missed during clearance surveys and killed during construction will be juveniles or eggs and locating the carcasses or shell fragments would not be feasible. To address this issue, we have used the threshold for capture or collection of subadult and adult individuals on the Project sites as a surrogate measure of mortality of the smaller size classes. Using this threshold as a surrogate assumes that our method of calculating the number of reproductive females, which is based on the estimated abundance of subadult and adult desert tortoises on the Project sites, allows us to also calculate the number of juveniles and eggs that may be affected. Consequently, finding more than three subadult and adult desert tortoises would indicate that a larger number of juveniles and eggs may be killed or destroyed during construction. Because clearance surveys would occur prior to commencement of construction activities, use of this threshold would allow reinitiation of consultation and a reassessment of the estimated mortality take prior to any mortality occurring on the ground.

Though we do not know how many juvenile desert tortoises and eggs will remain undetected on the Project site, we anticipate that construction of the proposed solar facility is likely to take, in the form of mortality or injury, all juvenile desert tortoises and eggs (i.e., up to two juveniles and an unquantifiable number of eggs) that occur on the Project site. However, as described above, because of the difficulty in monitoring take of these size classes, the number of subadults and adults captured or collected during construction of the proposed solar facility would serve as the surrogate to determine when the amount or extent of take is exceeded.

Although unlikely, desert tortoises that were undetected during clearance surveys for construction may be located during ground-disturbing activities. Though we do not know how many desert tortoises will subsequently be detected, all individuals located will be captured and translocated and any desert tortoise eggs that are located will be excavated and translocated. Take, in the form of capture and collection of all desert tortoises resulting from these incidental detections is exempted to ensure mortality and injury of desert tortoises is minimized.

No incidental take of desert tortoises is anticipated due to O&M of the proposed solar facility because such activities would occur within the perimeter security fence. However, we anticipate that fence maintenance and repair may result in incidental take in the form of mortality or injury, of no more than one subadult or adult desert tortoise per calendar year.

The Desert Sunlight biological opinion (Service 2011a) exempted take along the gen-tie line and associated access roads. However, if wire stringing is not conducted concurrently with that of Desert Sunlight, then take in the form of capture and collection as described in the Desert Sunlight biological opinion is exempted under this opinion. Because the applicant will implement the conservation measures identified under the proposed action, take, in the form of capture and collection, is anticipated for few, if any, individuals located during O&M activities along the gen-tie and associated access roads over the life of the project. Take, in the form of death or injury, of no more than one subadult or adult desert tortoise per calendar year is anticipated during O&M activities along the gen-tie, which will be localized and infrequent because access will be along existing routes and the applicant will implement numerous conservation measures to avoid and minimize death and injury of desert tortoises.

Because of the difficulty in estimating the number of desert tortoises that may occur along linear components, and the applicant will employ experienced biologists approved by the Service, BLM, and CDFW using sanctioned handling techniques, we do not expect that take, in the form of capture or collection, required to move desert tortoises out of harm's way during construction of the linear project components, will result in mortality or injury of any individuals, and will result in an overall benefit to the desert tortoise. Therefore, we are not establishing a reinitiation criterion or notification requirement for the number of individuals that would be moved out of harm's way during construction of linear project components.

EFFECT OF TAKE

In the accompanying biological opinion, the Service determined that these levels of anticipated take associated with this project alone are not likely to jeopardize the continued existence or adversely affect the recovery of the desert tortoise. However, the loss suitable desert tortoise habitat on the Project site could significantly impair habitat and population connectivity and long-term recovery potential of the species for the reasons discussed above under the “Effects of the Action” section.

REASONABLE AND PRUDENT MEASURES

The BLM and applicant will implement numerous conservation measures as part of the proposed action to minimize the incidental take of desert tortoises. Our evaluation of the proposed action is based on the assumption that the actions as set forth in the “Conservation Measures” section of this biological opinion will be implemented. Any changes to the conservation measures proposed by BLM or applicant or in the conditions under which project activities were evaluated may constitute a modification of the proposed action. If this modification causes an effect to desert tortoises that was not considered in the biological opinion, reinitiation of formal consultation pursuant to the implementing regulations of section 7(a)(2) of the Act (50 CFR § 402.16) may be warranted. The following reasonable and prudent measures supplements and clarifies select conservation measures included as part of the proposed action. The reasonable and prudent measures are necessary and appropriate to minimize the impact of take on desert tortoises.

1. The BLM shall ensure the level of incidental take anticipated in this biological opinion is commensurate with the analysis contained herein.
2. The BLM and applicant shall adhere to procedures set forth by CDFW when moving sick or injured desert tortoises within the State of California.

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Act, the BLM and applicant, and all agents and/or contractors, must comply with the following terms and conditions, which implement the reasonable and prudent measures described above, and are intended to minimize the impact of incidental take on the desert tortoise. These terms and conditions are non-discretionary.

The following terms and conditions implement reasonable and prudent measure 1:

- 1.1 To ensure that the measures proposed by the BLM and applicant are effective and properly implemented, the BLM and applicant must contact the Service immediately if it becomes aware that a desert tortoise has been killed or injured as a result of project activities. At that time and in coordination with the Service, BLM must review the

circumstances surrounding the incident to determine whether additional protective measures are required. Project activities may continue pending outcome of the review, provided the conservation measures included as part of the proposed action (see “Conservation Measures” section) and the terms and conditions in this biological opinion have been and continue to be fully implemented;

- 1.2 If more than one subadult or adult desert tortoise is killed or injured as a result of any construction activities covered by this biological opinion for the Project site, gen-tie line and associated access road, and the perimeter security fence, the BLM must reinitiate consultation on the proposed action;
- 1.3 If more than one subadult or adult desert tortoise is directly killed or injured in any calendar year as a result of any O&M activities covered by this biological opinion along the perimeter security fence of the solar facility, or the gen-tie line and associated access road, the BLM must reinitiate consultation on the proposed action; and
- 1.4 If more than three subadult or adult desert tortoises are identified for translocation during clearance surveys of the Project site then BLM must reinitiate consultation on the proposed action. As described above, the identification of more than these numbers of subadult or adult desert tortoises would also indicate that the anticipated level of take of juveniles and eggs will be exceeded, requiring reinitiation of consultation. This term and condition only applies to clearance of the project site for construction and does not apply to the short distance movement of desert tortoises out of harm’s way during activities that occur along the linear components.

The following term and condition implements reasonable and prudent measure 2:

- 2.1 Desert tortoises that are determined to be sick or injured may be relocated to an appropriate facility within California. The applicant shall submit to CDFW a written request indicating the number of desert tortoises to be relocated, the reason for relocating them (i.e., the nature of the disease or injury), the proposed facility to which the desert tortoises will be relocated, and the date on which they are proposed to be relocated. CDFW will provide a written response to each such request indicating, on a case-by-case basis, whether the relocation is authorized.

Reporting Requirements

BLM must provide an annual report by February 1 of each year during construction of each phase. Specifically, these reports must include information on any instances of desert tortoise death, injury, or handling; the circumstances of such incidents; and any actions undertaken to prevent similar incidents from reoccurring. In addition, these reports should provide detailed information on the results of relocation/translocation monitoring, including the location, health status, and body condition of any translocated desert tortoise. All reports shall be digital and include all monitoring-associated geospatial data. The BLM must also provide to the Service

copies of any Monthly and Annual Compliance Reports as required under the conservation measures described in the proposed action.

We request that the BLM provide us with any recommendations that would facilitate the implementation of the conservation measures while ensuring protection of the desert tortoise. We also request that the BLM provide us with the names of any Biological Monitors who assisted the Authorized Biologist and an evaluation of the experience they gained on the project and the Service qualifications form filled out for this project (available at:

http://www.fws.gov/ventura/species_information/protocols_guidelines/docs/dt/DT%20Auth%20Bio%20qualifications%20statement%2010_20_08.pdf), along with any narrative that would provide an appropriate level of information. This information would provide us with additional reference material in the event any of these individuals are proposed as potential Authorized Biologists for future projects.

DISPOSITION OF SICK, INJURED, OR DEAD SPECIMENS

The Palm Springs Fish and Wildlife Office (PSFWO) and CDFW Ontario Office is to be notified immediately if any desert tortoises are found sick, injured, or dead in the action area. Immediate notification means verbal (if possible) and written notice within 1 workday, and must include the date, time, and location of the carcass, and any other pertinent information. Applicant will ensure that an injured tortoise receives prompt veterinary care by a qualified veterinarian. If an injured animal recovers, the Service, BLM, and CDFW would determine the final disposition of the animal. However, if efforts to keep the injured animal separate from other tortoises and turtles are successful during the desert tortoise's treatment, then it is recommended that it be released at or near its capture point to continue to contribute to the persistence of the local desert tortoise population. If a desert tortoise is fatally injured or killed as a result of project-related activities Applicant will submit it for necropsy. Care will be taken by the designated staff in handling dead specimen(s) to preserve biological material in the best possible state.

The PSFWO also should be notified immediately at 760-322-2070 if any endangered or threatened species not addressed in this biological opinion is located in the Project during the ROW period. The same reporting requirements also shall pertain to any healthy individual(s) of any threatened or endangered species located in the action area that requires handling to move the individual(s) out of harm's way.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

The NECO Plan (BLM 2002) did not contemplate landscape-level threats (i.e., utility-scale solar development) to the extent reflected by recent ROW approvals and pending applications. As a result, the NECO Plan did not include specific protections for wildlife movement corridors or maintenance of overlapping home ranges. Therefore, we recommend aligning the eastern boundary of the Project with that of Desert Sunlight Solar Farm to maintain a 0.5 mile native habitat corridor around the eastern edge of the Project.

REINITIATION NOTICE

This concludes formal consultation on the BLM's proposal to issue a ROW grant to EDF for construction, operation, maintenance and decommissioning of the proposed Desert Harvest Project in Riverside County, California. Consistent with 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Federal involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of take specified in the incidental take statement is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this biological opinion; and (4) a new species is listed or critical habitat designated that may be affected by the action. In addition, if any of the stated assumptions used in our analysis are invalidated, BLM must reinitiate consultation.

If there are any substantive changes to the Project, including changes to the mitigation measures, or if the Service amends or replaces the BO, the Applicant shall be required to obtain a new consistency determination or a CESA incidental take permit for the Project from CDFW (see generally Fish & G. Code, §§ 2080.1, 2081, subds. (b) and (c)).

If you have any questions regarding this biological opinion, please contact Tera Baird of the PSFWO, 777 East Tahquitz Canyon Way, Suite 208, Palm Springs, California 92262 at 760-322-2070, extension 217.

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Personal Communications

Vamstad, M. 2011. Joshua Tree National Park. Email correspondence Desert Sunlight/Big Wash. Joshua Tree, California.

Appendix 1

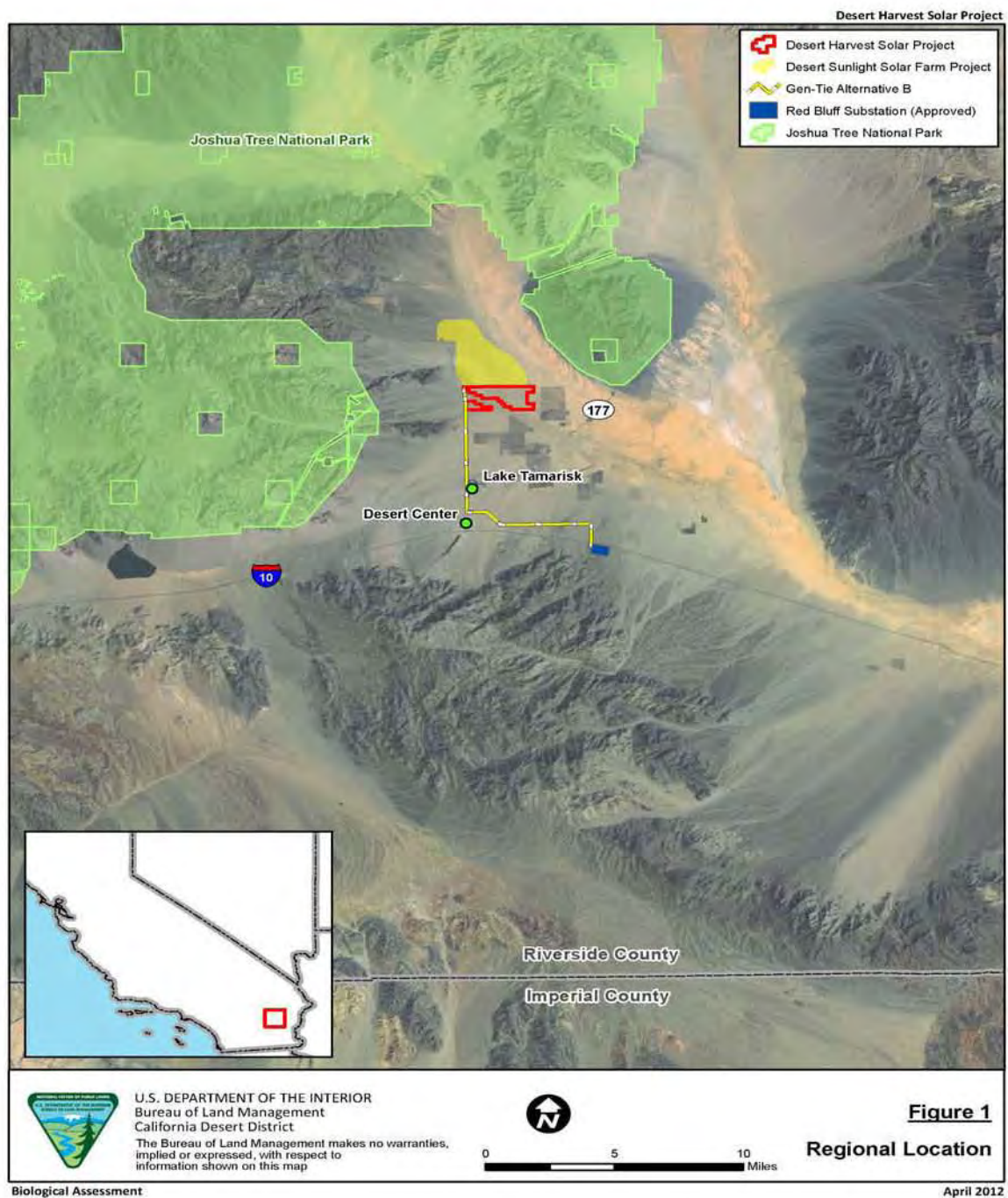


Figure 1. Desert Harvest Solar Project, Regional Location.

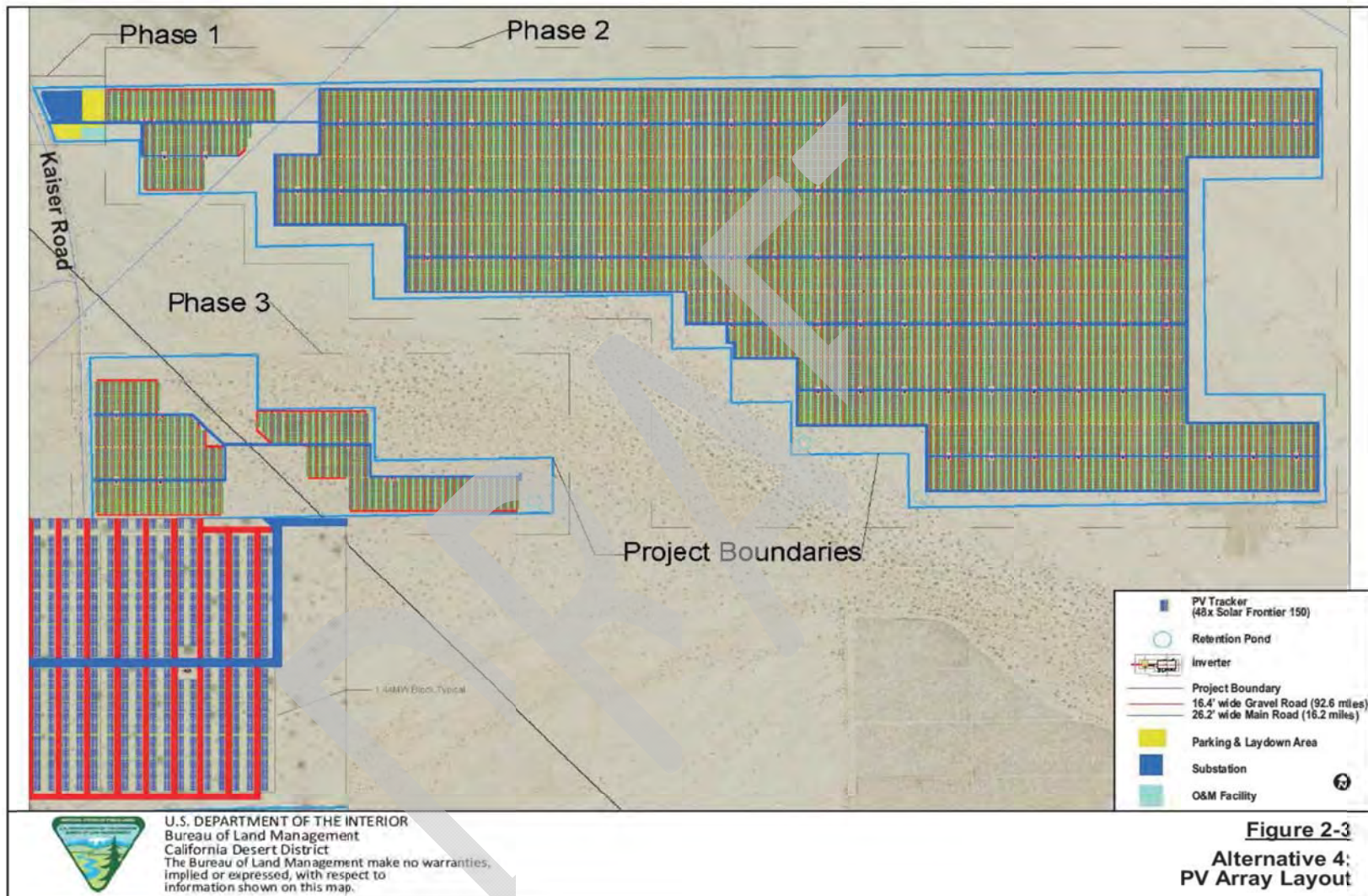


Figure 2. Desert Harvest Solar Project, Project Phasing and PV Layout.

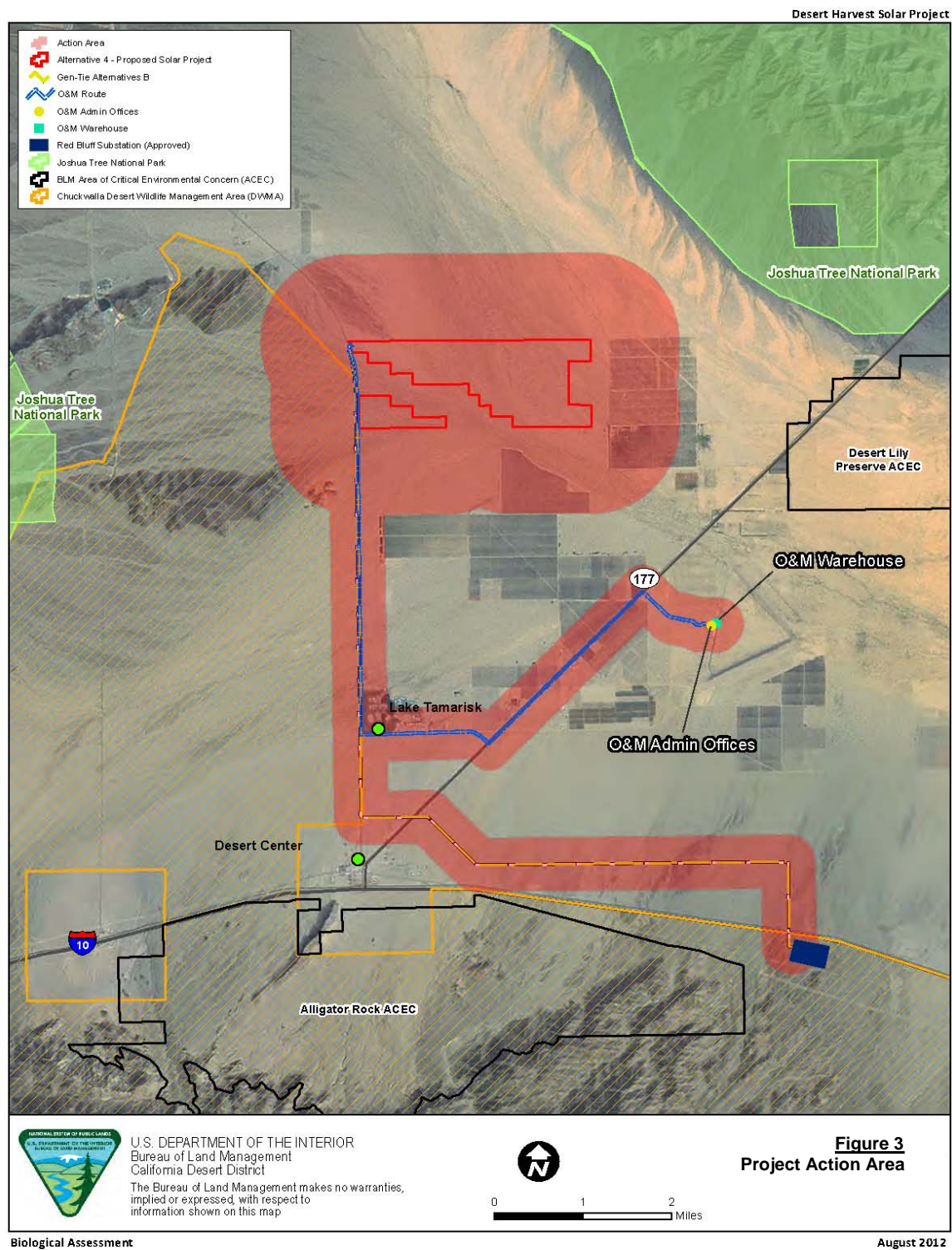


Figure 3. Desert Harvest Solar Project, Project Action Area.

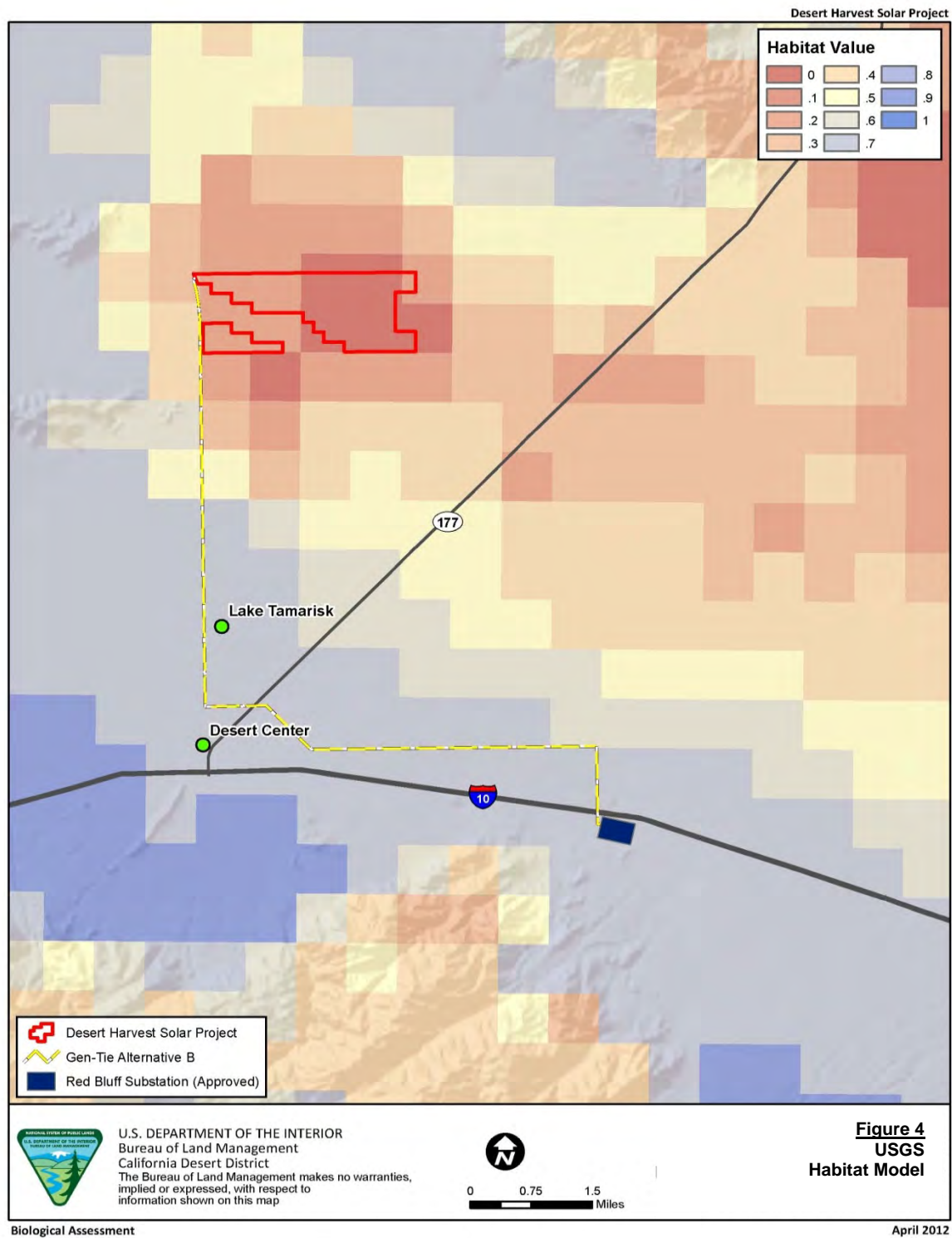


Figure 4. Desert Harvest Solar Project, USGS Habitat Model.

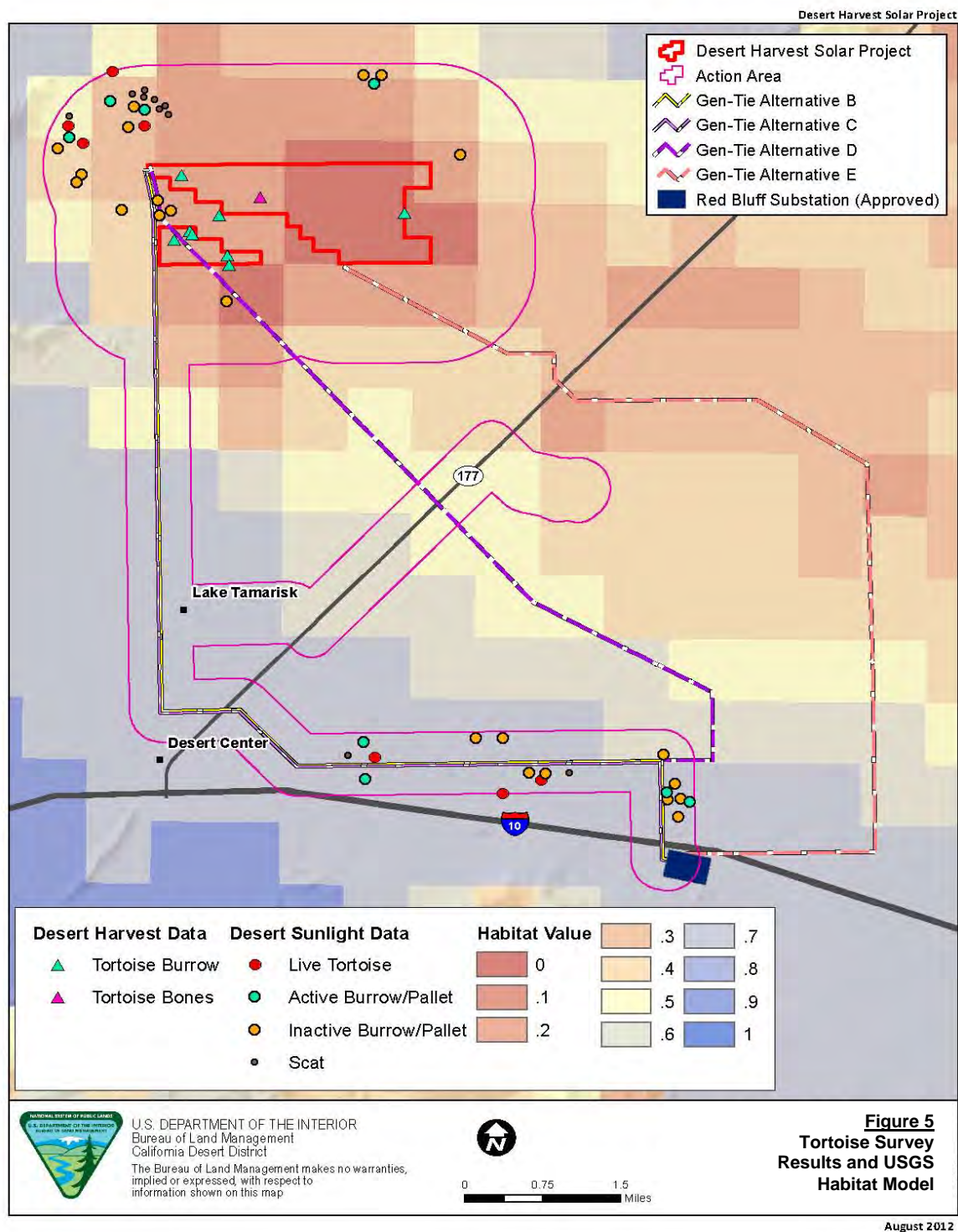


Figure 5. Desert Harvest Solar Project, Tortoise Survey Results and USGS Habitat Model.

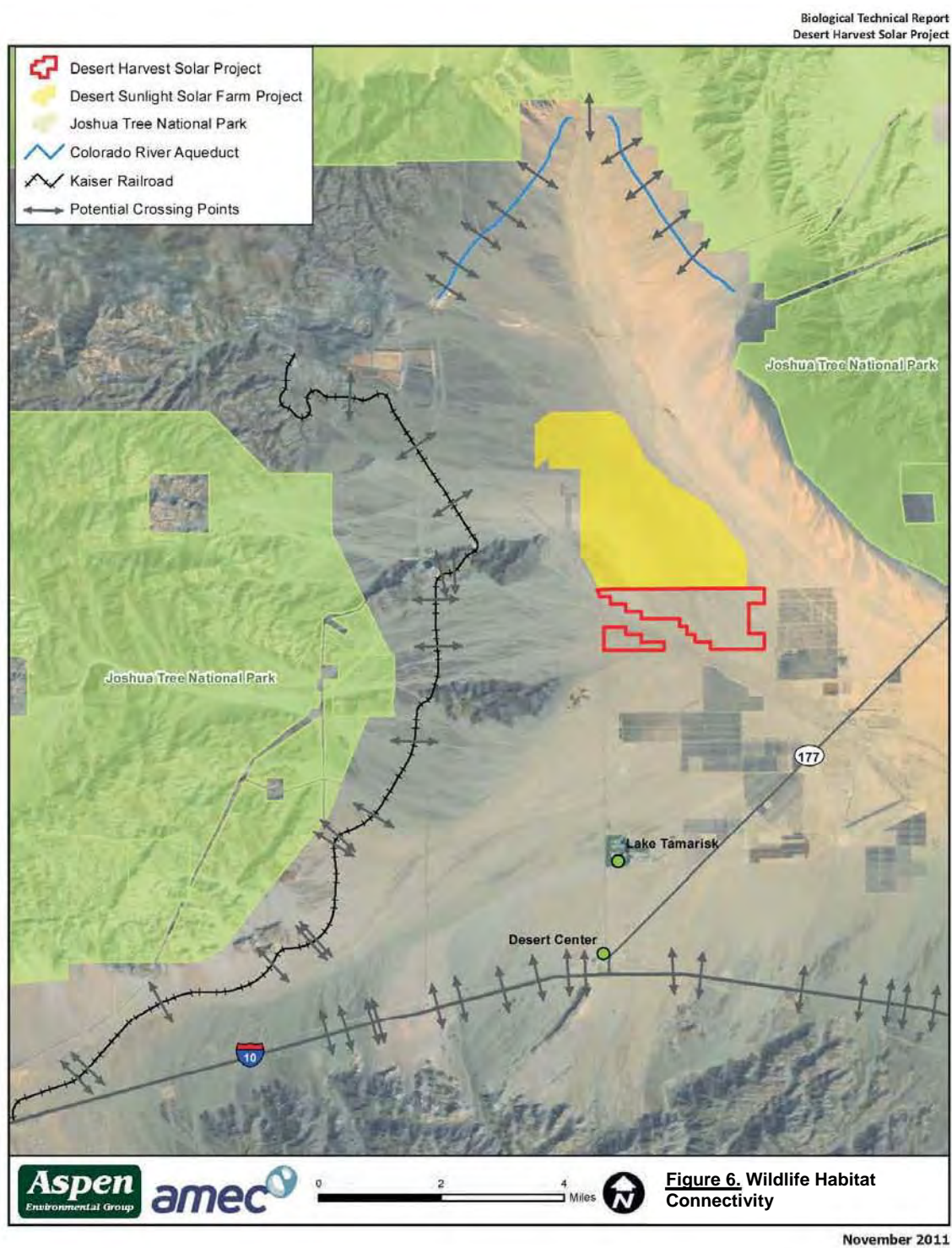


Figure 6. Desert Harvest Solar Project, Wildlife Habitat Connectivity.